OPEN MUSIC THEORY-FUNDAMENTALS

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Open Music Theory-Fundamentals

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TABLE OF CONTENTS

Licensing

1: Unit 1- Intervals
- 1.1: Introduction to Western Musical Notation
- 1.2: Notation of Notes, Clefs, and Ledger Lines
- 1.3: Reading Clefs
- 1.4: The Keyboard and the Grand Staff
- 1.5: Half Steps, Whole Steps, and Accidentals
- 1.6: American Standard Pitch Notation (ASPN)
- 1.7: Other Aspects of Notation

2: Unit 2- Basics of Rhtythm
- 2.1: Rhythmic and Rest Values
- 2.2: Simple Meter and Time Signatures
- 2.3: Compound Meter and Time Signatures
- 2.4: Other Rhythmic Essentials

3: Unit 3- Scales
- 3.1: Major Scales, Scale Degrees, and Key Signatures
- 3.2: Minor Scales, Scale Degrees, and Key Signatures
- 3.3: Introduction to Diatonic Modes and the Chromatic “Scale”

4: Unit 4- Intervals

5: Unit 5- Triads

6: Unit 6- Seventh Chords

7: Unit 7- Basics of Sight-singing and Dictation

8: Unit 8- Inversion and Figured Bass

9: Unit 9- Advanced Topics
- 9.1: Roman Numerals and SATB Chord Construction
- 9.2: Texture

Index

Glossary

Detailed Licensing

Detailed Licensing

Licensing

A detailed breakdown of this resource's licensing can be found in ***Back Matter/Detailed Licensing****.*

CHAPTER OVERVIEW

1: Unit 1- Intervals

1.1: Introduction to Western Musical Notation
1.2: Notation of Notes, Clefs, and Ledger Lines
1.3: Reading Clefs
1.4: The Keyboard and the Grand Staff
1.5: Half Steps, Whole Steps, and Accidentals
1.6: American Standard Pitch Notation (ASPN)
1.7: Other Aspects of Notation

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SECTION OVERVIEW

1.1: Introduction to Western Musical Notation

Key Takeaways

- The term "**Western** musical notation" refers to written symbols that are used to communicate musical sounds.
- Western musical notation is one of many different systems of musical notation that appear across time spans, places, and cultures.
- Someone who writes down music chooses a musical notation system based on these factors, also known as their social context or **milieu**.

Music is an auditory or **aural** art form that can be represented visually with notation.

Think about what it's like to translate one language to another. It can be a challenging task—a direct word-for-word translation isn't always possible or useful, so a translator needs to think about how best to communicate to the reader. Similarly, writing down sounds involves making decisions about what needs to be communicated and how. No system of notation could capture every aspect of sound in full detail and still be useful or readable, so only some musical elements can be depicted.

Despite this, there are several advantages to written musical notation: a written musical work does not need to be memorized, and details can be recorded that might otherwise be forgotten. Additionally, written notation makes musical works accessible to more people, since anyone who knows the notation system can learn a notated work on their own without the help of a teacher.

Imagine inventing a way to write down a favorite song or musical work so that a musician could perform it without ever having heard it before. In the assignment below ("Inventing a Notation System"), you'll have the opportunity to do this for a specific musical work or song of your choice. Here are some questions to consider as you think about creating your own musical notation system:

1. What are the most important musical features of the work? What are the less important musical features?
2. What are the musical features that you would write down? Are there any that you would leave out?
3. Would your answers to questions 1 and 2 change if you were writing down a different song or work?
4. How would you explain your notation system to someone else?

Online Resources

- "How was Musical Notation Invented? A Brief History." (WQXR)
- "How did Music Notation Actually Begin?" (Classic FM)

Assignments

1. Inventing a Notation System (.pdf, .docx); Rubric (.pdf, .docx)

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SECTION OVERVIEW

1.2: Notation of Notes, Clefs, and Ledger Lines

Key Takeaways

- A **note** indicates both **pitch** and **rhythm**.
- Notes are written on a **staff**. Notes with a higher frequency (shorter wavelength) are written higher on the staff than notes with a lower frequency (longer wavelength). That is, higher notes are placed above lower ones.
- A **notehead** must be written carefully on a staff. A notehead is oval (not round); additionally, it should be neither too large nor too small, and it is tilted slightly upward toward the right.
- The **stems** of notes can point either upward (on the right side of a note) or downward (on the left side of a note). For notes above the middle line, the stem points downward, and for notes below the middle line, stems point upward. Notes on the middle line can point in either direction, depending on the surrounding notes.
- Writing seconds always involves displacing one note to the left or right of a stem. The lower note always goes on the left, regardless of whether the stem points up or down.
- A **clef** indicates which pitches are assigned to the lines and spaces on a staff.
- Extra lines called **ledger lines** extend a staff higher or lower.

Western musical notation privileges two musical features: **pitch** and **rhythm**. Pitches are notated vertically (on the *y*-axis), while rhythms are notated horizontally (on the *x*-axis). Western musical notation is read left-to-right and top-to-bottom, like the page of a book in written English.

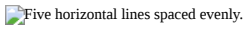
Notation of Notes

A **note** indicates both pitch and rhythm. Each written note consists of a **notehead** (either empty or filled in) and may also have a **stem** and a **beam** or **flag** (see Rhythmic and Rest Values). **Example 1** shows an illustration of noteheads, stems, beams, and flags:

Example 1. *Noteheads, stems, beams, and flags.*

Staff Notation

A **staff** (plural "staves") is essential for conveying pitch. A staff consists of five horizontal lines, evenly spaced, and each note is placed on the line or space that corresponds to its pitch (see Clefs below). **Example 2** depicts a staff:



Example 2. *A staff.*

Placing Notes on a Staff

Noteheads on a line should fill in half of each space above and below. Noteheads in a space should just touch the lines above and below. **Example 3** shows examples of correct noteheads, both open and filled in, both on lines and in spaces:

Example 3. *Correct noteheads, open (white) and filled in (black), both on lines and in spaces.*

Noteheads should be oval (not round), and they are tilted slightly upward toward the right. **Example 4** shows incorrect noteheads. As you can see, noteheads can be drawn too small, too big, or the wrong shape.

Example 4. *Incorrect examples of noteheads.*

Stems and Beams

The **stems** of notes can point either upward (on the right side of a note) or downward (on the left side of a note). For notes above the middle line, the stem points downward, and for notes below the middle line, stems point upward. Notes on the middle line can point in either direction, depending on the surrounding notes. This is shown in **Example 5:**

Example 5. *Correct stemming directions.*

Stemming directions and beaming conventions are discussed more in Simple Meter and Time Signatures and Compound Meter and Time Signatures. When hand-drawing stems, their length is equal to four lines of the staff. Beams are about four times thicker than stems.

Drawing Seconds

When notes at the interval of a second (see the Generic Intervals section of The Keyboard and the Grand Staff) occur harmonically, they are on an adjacent line and space of the staff, so one note needs to be displaced to the left or right of the stem. The lower note always goes on the left, regardless of whether the stem points up or down. **Example 6** shows the correct way to draw seconds:

Three seconds are shown. The lower note is always on the left.

Example 6. *Three correct seconds.*

Seconds should not be stacked on top of one another, nor should the lower note be on the right, as seen in **Example 7:**

Three incorrect seconds are shown. One stacks two notes directly on top of each other. The right note is on the bottom in the other two pairs of notes.

Example 7. *Three incorrect seconds.*

Drawing seconds in seventh chords is discussed in Seventh Chords.

Clefs

The notes drawn on the lines and spaces of a staff represent pitches. Musicians use spatial metaphors to describe notes placed on a staff: notes appearing toward the top of the staff are said to be “higher” than those toward the bottom, which are said to be “lower.”

Higher pitches are produced by **sound waves** with a shorter **wavelength** (and consequently a higher **frequency**); sound waves with a longer wavelength (lower frequency) produce lower pitches. Such spatial metaphors vary with **milieu**—i.e. across cultures and time periods. For example, for some music theorists in ancient Greece, higher-sounding notes were visually placed below lower-sounding notes.[1] As **Example 8** demonstrates, this is because these theorists were likely most familiar with string instruments that functioned similarly to the violins, guitars, and harps we know today.

Example 8. *Dr. Jacob Tews (Christopher Newport University) explains more about ancient Greek musical notation.*

For notes to convey pitch information beyond "higher" and "lower," the staff on which they appear must include a **clef.** A clef indicates which pitches are assigned to the lines and spaces on a staff (see also Reading Clefs). The two most commonly used clefs today are the **treble** clef and **bass** clef. Two other clefs that you may encounter are the **alto** clef and the **tenor clef**. **Example 9** shows the same pitch placed after the treble, bass, alto, and tenor clefs:

Example 9. *The same pitch placed after a treble, bass, alto, and tenor clef.*

Higher notes, such as those played by a flute or sung by a soprano, are usually written in treble clef, and lower notes, such as those played by a trombone or sung by a bass, are usually written in bass clef. Alto and tenor clefs are relatively rare compared to treble and bass. But in some cases, alto clef is used for medium-high notes, and tenor clef is used for medium-low notes.

Drawing Clefs

One can draw a treble clef in three simple steps, as demonstrated in **Example 10**:

Example 10. *Drawing a treble clef in three steps.*

1. Draw a slanted vertical line that extends slightly above and below the staff.
2. Draw a half circle that intersects with your slanted line at the second staff line from the top.
3. Circle around the second staff line from the bottom.

Likewise, one can also draw a bass clef in three steps, as shown in **Example 11**:

Example 11. *Drawing a bass clef in three steps.*

1. Draw a dot on the second staff line from the top.
2. Draw a backward C that ends in the bottom space of the staff, making sure that the top part of the C does not extend above the staff.
3. Place two dots to the right of the backward C, in the top two spaces of the staff.

One can draw an alto clef in four steps, as **Example 12** shows:

Example 12. *Drawing an alto clef in four steps.*

1. Draw a thick vertical line that spans the staff.
2. Draw a thinner vertical line next to it.
3. Draw two backward Cs, the first taking up slightly less than the top half of the staff and the second taking up slightly less than the bottom half of the staff.
4. Connect these backward Cs with a point that rests on the middle line of the staff.

As seen in **Example 13**, the tenor clef is drawn the same way as the alto clef, just shifted up one line of the staff higher. The vertical lines in steps 1 and 2 begin on the second staff line from the bottom and extend slightly above the staff. The first backward C extends slightly above the top half of the staff, and the second takes up slightly less than the middle two spaces of the staff. The point connecting them rests on the second staff line from the top.

Example 13. *Drawing a tenor clef in four steps.*

Sometimes when musicians draw the alto or tenor clef, they do so by writing the letter "K" as a form of shorthand. **Example 14** shows this:

A hand-drawn alto and tenor clef, in which the clefs are shaped like the letter K.

Example 14. *Using the letter "K" to draw the alto and tenor clefs.*

Writing Ledger Lines

When notes are too high or low to be written on a staff, small lines called **ledger lines** are drawn to extend the staff. **Example 15** shows ledger lines written above and below a staff:

Depicts a staff with a bass clef. Above and below the staff are ledger lines. No noteheads are present.

Example 15. *Ledger lines, both above and below a staff with a bass clef.*

Example 16 shows notes (with stems and beams) drawn on ledger lines, above and below a staff.

Example 16. *Notes (with stems and beams) on ledger lines, above and below a staff with a treble clef.*

When writing ledger lines, be sure not to put in an extra ledger line above or below the note you are writing. **Example 17** first shows the correct way of writing notes on ledger lines, followed by the incorrect way, with extra ledger lines above and below the notes:

Example 17. *Correct and incorrect notation of ledger lines.*

Online Resources

- Pitch and Frequency (the Physics of Sound) (physicsclassroom.com)
- The Music Staff (essential-music-theory.com)
- Drawing Notes (YouTube)
- Clefs (Music Notes Now)
- Drawing Treble and Bass Clefs (YouTube)
- Drawing C Clefs (Ultimate Music Theory)
- The Staff, Clefs, and Ledger Lines (musictheory.net)
- Music Notation Style Guide (Indiana University)

Assignments from the Internet

A. The Staff (.pdf)
B. Drawing Notes on Lines and Spaces, High and Low (.pdf)

Assignments

1. Writing Noteheads, Clefs, and Ledger Lines (.pdf, .docx)

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- Ledger Lines with Notes © Chelsey Hamm is licensed under a CC BY-SA (Attribution ShareAlike) license
- Correct Incorrect Ledger Lines © Sarah Louden is licensed under a CC BY-SA (Attribution ShareAlike) license

Footnote

1. For one example, see André Barbera, *The Euclidean Division of the Canon: Greek and Latin Sources. New Critical Texts and Translations on Facing Pages, with an Introduction, Annotations, and Indices Verborum and Nominum et Rerum* (Lincoln: University of Nebraska Press, 1991), 276–9. ↵

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SECTION OVERVIEW

1.3: Reading Clefs

Key Takeaways

- **Pitch** in Western musical notation is designated by the letters A, B, C, D, E, F, and G, which repeat in a loop.
- Different **clefs** make reading different **ranges** easier.
- Each clef indicates how the lines and spaces of the staff correspond to pitch.

In Western musical notation, pitches are designated by the first seven letters of the Latin alphabet: A, B, C, D, E, F, and G. After G these letter names repeat in a loop: A, B, C, D, E, F, G, A, B, C, D, E, F, G, A, B, C, etc. This loop of letter names exists because musicians and music theorists today accept what is called **octave equivalence**, or the assumption that pitches separated by an **octave** should have the same letter name. More information about this concept can be found in the next chapter, The Keyboard and the Grand Staff.

This assumption varies with **milieu**. For example, some ancient Greek music theorists did not accept octave equivalence. These theorists used more than seven letters of the Greek alphabet to name pitches.

Clefs and Ranges

The Notation of Notes, Clefs, and Ledger Lines chapter introduced four clefs: treble, bass, alto, and tenor. A clef indicates which pitches are assigned to the lines and spaces on a staff. In the next chapter, The Keyboard and the Grand Staff, we will see that having multiple clefs makes reading different **ranges** easier. The treble clef is typically used for higher voices and instruments, such as a flute, violin, trumpet, or soprano voice. The bass clef is usually utilized for lower voices and instruments, such as a bassoon, cello, trombone, or bass voice. The alto clef is primarily used for the viola, a mid-ranged instrument, while the tenor clef is sometimes employed in cello, bassoon, and trombone music (although the principal clef used for these instruments is the bass clef).

Each clef indicates how the lines and spaces of the staff correspond to pitch. Memorizing the patterns for each clef will help you read music written for different voices and instruments.

Reading Treble Clef

The **treble clef** is one of the most commonly used clefs today. **Example 1** shows the letter names used for the lines of a staff when a treble clef is employed. One **mnemonic device** that may help you remember this order of letter names is “Every Good Bird Does Fly” (E, G, B, D, F). As seen in **Example 1**, the treble clef wraps around the G line (the second line from the bottom). For this reason, it is sometimes called the “G clef.”

Example 1. *The letter names for the lines with a treble clef.*

Example 2 shows the letter names used for the spaces of a staff with a treble clef. Remembering that these letter names spell the word “face” may make identifying these spaces easier.

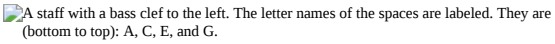
Example 2. *The letter names for the spaces with a treble clef.*

Reading Bass Clef

The other most commonly used clef today is the **bass clef**. **Example 3** shows the letter names used for the lines of a staff when a bass clef is employed. A mnemonic device for this order of letter names is “Good Bikes Don’t Fall Apart” (G, B, D, F, A). The bass clef is sometimes called the “F clef”; as seen in **Example 3**, the dot of the bass clef begins on the F line (the second line from the top).

Example 3. *The letter names for the lines with a bass clef.*

Example 4 shows the letter names used for the spaces of a staff with a bass clef. The mnemonic device “All Cows Eat Grass” (A, C, E, G) may make identifying these spaces easier.



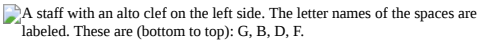
Example 4. *The letter names for the spaces with a bass clef.*

Reading Alto Clef

Example 5 shows the letter names used for the lines of the staff with the **alto clef**, which is less commonly used today. The mnemonic device “Fat Alley Cats Eat Garbage” (F, A, C, E, G) may help you remember this order of letter names. As seen in **Example 5**, the center of the alto clef is indented around the C line (the middle line). For this reason it is sometimes called a “C clef.”

Example 5. *The letter names for the lines with an alto clef.*

Example 6 shows the letter names used for the spaces of a staff with an alto clef, which can be remembered with the mnemonic device “Grand Boats Drift Flamboyantly” (G, B, D, F).



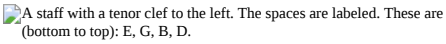
Example 6. *The letter names for the spaces with an alto clef.*

Reading Tenor Clef

The **tenor clef**, another less commonly used clef, is also sometimes called a “C clef,” but the center of the clef is indented around the second line from the top. **Example 7** shows the letter names used for the lines of a staff when a tenor clef is employed, which can be remembered with the mnemonic device “Dodges, Fords, and Chevrolets Everywhere” (D, F, A, C, E):

Example 7. *The letter names for the lines with a tenor clef.*

Example 8 shows the letter names used for the spaces of a staff with a tenor clef. The mnemonic device “Elvis’s Guitar Broke Down” (E, G, B, D) may make identifying these spaces easier.



Example 8. *The letter names for the spaces with a tenor clef.*

Ledger Lines

When notes are too high or low to be written on a staff, small lines are drawn to extend the staff. You may recall from the previous chapter that these extra lines are called **ledger lines**. Ledger lines can be used to extend a staff with any clef. **Example 9** shows ledger lines above a staff with a treble clef:

Example 9. *Ledger lines extend a staff upwards with a treble clef.*

Notice that each space and line above the staff gets a letter name with ledger lines, as if the staff were simply continuing upwards. The same is true for ledger lines below a staff, as shown in **Example 10**:

Example 10. *Ledger lines extend a staff downwards with a bass clef.*

Notice that each space and line below the staff gets a letter name with ledger lines, as if the staff were simply continuing downwards.

Online Resources

- The Staff, Clefs, and Ledger Lines (musictheory.net)
- Flashcards for Treble, Bass, Alto, and Tenor Clefs (Richman Music School)
- Printable Treble Clef Flash Cards (Samuel Stokes Music) (pages 3 to 5)
- Printable Bass Clef Flash Cards (Samuel Stokes Music) (pages 1 to 3)
- Printable Alto Clef Flash Cards (Samuel Stokes Music)
- Printable Tenor Clef Flash Cards (Samuel Stokes Music)
- Paced Game: Treble Clef (Tone Savvy)
- Paced Game: Bass Clef (Tone Savvy)
- Paced Game: Alto Clef (Tone Savvy)
- Paced Game: Tenor Clef (Tone Savvy)

Assignments on the Internet

Easy

A. Treble and Bass Clefs (.pdf)
B. Treble Clef (.pdf)
C. Bass Clef (.pdf)
D. Alto Clef (.pdf)
E. Tenor Clef (.pdf)

Medium

A. Worksheets in Treble Clef (.pdf)
B. Treble Clef with Ledger Lines (.pdf)
C. Worksheets in Bass Clef (.pdf, .pdf)
D. Bass Clef with Ledger Lines (.pdf)
E. Worksheets in Alto Clef (.pdf, .pdf)
F. Worksheets in Tenor Clef (.pdf)

Advanced

A. All Clefs (.pdf)

Assignments

1. Writing and Identifying Notes Assignment #1 (.pdf, .mscx)

2. Writing and Identifying Notes Assignment #2 (.pdf, .mscx)

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TABLE OF CONTENTS

Key Takeaways

- Playing the piano will help you in your music theoretical studies by allowing you to engage **kinesthetically** with music.
- A pattern of black keys grouped into twos and threes repeats on the piano keyboard for seven octaves.
- The white note C is to the immediate left of the two-note black key pattern, while the white note F is to the immediate left of the three-note black key pattern.
- Piano players, also called pianists, read music on the **grand staff**.
- **Middle C** is the note that appears on the line between the two staves in a grand staff.
- When counting intervals on a piano keyboard, always count the first note as "one."

Many students find studying music theory easier when they engage with music **kinesthetically**. In other words, physically creating sounds by playing a musical instrument (such as the piano) helps you to better visualize and **audiate** the music you are writing down or studying. This allows students to understand the relationship between different pitches more quickly.

The Piano Keyboard

Learning to play notes on the piano is one easy way to engage with music kinesthetically. You may find access to a piano keyboard (acoustic or electronic) at your school. You may also purchase an inexpensive electronic keyboard if you like. Another option is to download a free piano app that you can play on your phone, such as Tiny Piano.

In **Example 1**, notice that the keyboard has both white keys and black keys. The black keys are grouped into sets of either three or two. In **Example 2**, notice that the sets of three and two black keys alternate throughout the entire length of a piano keyboard, repeating the pattern for each **octave**.

Example 1. *A small portion of a piano keyboard.*

Example 2. *A larger portion of a piano keyboard.*

Playing the Piano

When you sit at the piano, it is important to sit up straight, keeping your head over your shoulders, which should be kept down. Your elbows should be a comfortable distance from your body, and your fingers should remain arched (as if you were pulling a library book off of a shelf). Keep your knees and wrists flexible (not stiff), and keep your feet flat on the ground unless you are using the pedals.

Example 3 explains how to achieve proper posture at the piano.

https://youtu.be/93k3JolSjF8

Example 3. *Dr. Benjamin Corbin (Christopher Newport University) demonstrates proper piano posture.*

Octave Equivalence and White-Key Letter Names on the Piano Keyboard

Example 4 shows a piano keyboard with the letter names of the white key pitches labeled. The same letter names appear on different keys of the keyboard. As discussed in the previous chapter, pitches in Western musical notation are designated by the letters A, B, C, D, E, F, and G, repeating in a loop. Because of the principle of **octave equivalence** in the Western system, pitches separated by an **octave** have the same letter name.

Example 4. *The letter names of the white key pitches are labeled.*

On the piano keyboard, when the black keys appear as a set of two, the note to their immediate left is C. With a set of three black keys, the note to their immediate left is F.

The Grand Staff

Music for the piano is typically written in both the treble and bass clefs on a **grand staff**, as shown in **Example 5**. To make a grand staff, a staff with a treble clef is placed above a staff with a bass clef. The two staves are connected on the left side with a line and a brace. Typically, the pianist plays the lower notes (in the bass clef) with their left hand and the higher notes (in the treble clef) with their right hand.

A grand staff; the line and brace have been labeled

Example 5. *A grand staff is connected with a line and a brace.*

Example 6 shows the lines and spaces on the grand staff labeled with letter names. As you can see, the letter names of the lines and spaces of the treble and bass clefs match what was discussed in the prior chapter (Reading Clefs).

Example 6. *A grand staff with the lines and spaces labeled with pitch names.*

Let's take a closer look at the ledger-line notes that might appear below the treble staff and above the bass clef staff. **Example 7** shows some of these notes, labeled with letter names. Each vertical pair of notes is the same pitch, even though the notes are

notated in two different clefs. (The notes with upward-pointing stems belong to the treble clef staff, while the notes with downward-pointing stems belong to the bass clef staff.)

Pitches are shown above the bass clef staff and below the treble clef staff. They are labelled with the letter names D, C, B, A, G.

Example 7. *Pitches below the treble clef staff and above the bass clef staff, labeled with letter names.*

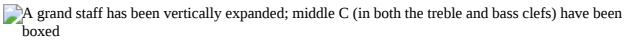
Example 8 shows the staves of **Example 7** vertically condensed—how these notes would appear if there were not so much space in between the treble clef and bass clef staves of a grand staff. The letter names are the same in **Example 8** as they were in **Example 7**.

Example 8. *The staves of* ***Example 7*** *have been vertically condensed and the two notes combined into one (with two stems).*

Example 9 shows a vertically condensed grand staff with the note C boxed. This boxed C is called **middle C**, so named because in the vertically condensed grand staff shown in **Example 9**, it appears in the middle of the treble and bass clef staves. Additionally, middle C is the note that appears to be around the middle of a piano keyboard, usually underneath the brand name.

Example 9. *The note C is boxed in a vertically condensed grand staff.*

Example 10 shows **Example 9** vertically expanded to its regular spacing, with middle C still boxed. Though it now appears in both the treble clef and bass clef staves, this note would still sound as the same pitch.



Example 10. *A vertically expanded* ***Example 9****.*

Generic Intervals (Interval Size)

Often in music theory, you will want to measure or describe the distance between notes—either on a piano keyboard or on a staff. This "count" of notes on a piano keyboard or staff is called a **generic interval**. When counting generic intervals, it is important to know that when you count the first note, it should be counted as one and not zero. **Example 11** shows two notes, an F and a C, on a staff with a treble clef.If you count the notes F to C in **Example 11** (by counting each line and space between the two notes), you may be tempted to do this: F to G is one, G to A is two, A to B is three, and B to C is four. However, this would be incorrect. Instead, you need to count F as one, F to G as two, G to A as three, A to B as four, and B to C as five. Therefore, we would say that F and C are five notes apart, not four. Music theorists and musicians would call the distance between these two notes a "generic fifth."

Example 11. *An example of a generic fifth.*

Online Resources

- Piano Posture Tips (Liberty Park Music)
- Naming White Keys Practice (musictheory.net)
- The Grand Staff (musictheory.net)
- Grand Staff Note Reading Game (readmusicfree.com)
- Generic Intervals (musictheory.net)
- Blank Keyboards for Students or Teachers

Assignments on the Internet

A. Drawing the Grand Staff, Identifying Notes (.pdf)
B. Identifying Notes on the Grand Staff without Accidentals (.pdf, .pdf, .pdf, .pdf, .pdf)
C. Identifying White Keys on the Piano (.pdf, .pdf)

Assignments

1. White Keys on the Piano and the Grand Staff (.pdf, .docx)
2. The Piano Keyboard and the Grand Staff with Ledger Lines (.pdf, .docx)
3. Generic Intervals (.pdf, .docx)
4. Grand Staff Note Names with Ledger Lines (.pdf, .docx)

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- Grand Staff Brace Line © Sarah Louden is licensed under a CC BY-SA (Attribution ShareAlike) license

SECTION OVERVIEW

1.5: Half Steps, Whole Steps, and Accidentals

Key Takeaway

- A **half step** above a key on the piano is the key to its immediate right, while a half step below a key on the piano is the key to its immediate left.
- A **whole step** is two half steps. A whole step above is two keys to its right, while a whole step below is two keys to its left.
- An **accidental** changes the pitch of a note. A **sharp** raises a note by a half step, while a **flat** lowers a note by a half step. A **natural** cancels a previous accidental.
- A **double sharp** raises a note by a whole step, while a **double flat** lowers a note by a whole step.
- Be sure to write accidentals to the left of a note, directly across the line or space on which a note appears.
- Notes have **enharmonic equivalence** when they are spelled differently but sound the same.

In the last chapter, The Keyboard and the Grand Staff, we discussed the letter names of the white keys on the piano keyboard and noted that the black keys are grouped into alternating sets of two or three. Before we discuss the names of the black keys, however, we must first learn about half steps and whole steps.

Half Steps and Whole Steps

A **half step** is considered to be the smallest **interval**, or distance between two notes, in Western musical notation. **Example 1** shows a piano keyboard with the letter names of the white-key pitches and some half steps labeled. On the piano keyboard (see **Example 1**), for most of the white-key notes, a half step above that note will be the black key to its upper right, while a half step below it will be the black key to its upper left. For example, the black key to the upper right of G is “in between” the notes G and A; one would say that this black key is a half step above G and a half step below A. Two pairs of white keys—E/F and B/C—do not have black keys in between them (see **Example 1**). This is because E–F and B–C are both half steps. Having the black keys grouped into sets of either two or three makes it easier for a keyboardist to see and feel them more quickly.

Example 1. *A piano keyboard with letter names on the white keys; some half steps are labeled.*

A **whole step** is the equivalent of two half steps. **Example 2** shows a piano keyboard with the letter names of the white key pitches labeled, and some whole steps bracketed. Pairs of white keys with a black key in between them (A and B, C and D, D and E, F and G, and G and A) are a whole step apart. To find a whole step above the notes E or B, simply count two keys to the right: a whole step above E is the black key to the right of the note F, while a whole step above B is the black key to the right of the note C. Likewise, count two keys to the left to find a whole step below the notes C or F: the black keys to the left of the notes B and E, respectively. To find a whole step from a black key you will want to count two keys to the right or left. For example, a whole step above the black key to the right of C is the black key to the right of the note D. A whole step below the black key to the left of B is the black key to the left of the note A.

Example 2. *A piano keyboard with letter names on the white keys; some whole steps are labeled.*

What do half steps and whole steps sound like? The short video shown in **Example 3** demonstrates:

https://youtu.be/a2q0xBYo4Z0

Example 3. *Dr. Chelsey Hamm (Christopher Newport University) demonstrates the sound of a half step and a whole step.*

Sharps, Flats, and Naturals

An **accidental** changes the pitch of a note. A **sharp** (♯) looks like a tilted hashtag, and it raises a note by a half step. A **flat** (♭) looks like a slanted lowercase "b," and it lowers a note by a half step. A **natural** (♮) looks like a tilted box with a line sticking out of the top left and bottom right corners, and it cancels a previous accidental such as a sharp or flat. Sharps, flats, and naturals are the three most common accidentals.

A **double sharp** (or 𝄪) raises a note by two half steps (i.e., a whole step). A **double flat** (𝄫) lowers a note by two half steps (i.e., a whole step). Accidentals are always written to the left of a note, regardless of stem direction. An accidental should be written directly across the line or space on which a note appears.

Example 4 shows both correct and incorrect ways to notate sharps, flats, and naturals:

Example 4. *Correct and incorrect ways to draw accidentals.*

The Black Keys on the Piano Keyboard

Example 5 shows a piano keyboard with the letter names of the black keys labeled. Black keys that are a half step above a white key take the name of the white key and add the word "sharp." For example, the black key to the right of the note C is called "C-sharp" and is written as C♯. Black keys that are a half step below a white key take the name of the white key and add the word "flat." For example, the black key to the left of the note D is called "D-flat" and is written as D♭.

A piano keyboard is shown. The white and black keys are labeled. Each black key note has both a sharp and a flat name.

Example 5. *A piano keyboard with the letter names of the black keys labeled.*

F is also known as E♯, and E is also known as F♭. C is also known as B♯, and B is also known as C♭. **Example 6** also shows some of the double-sharp and double-flat accidentals. A double sharp is two half steps above a note. For example, D𝄪 is also E; E𝄪 is also F♯ (or G♭). A double flat is two half steps below a note. For example, A𝄫 is also G; C𝄫 is also B♭ or A♯.

Example 6. *Double accidentals on the piano keyboard.*

Enharmonic equivalence

You will have noticed by now that each key on the piano keyboard has more than one name. Notes have **enharmonic equivalence** when they are spelled differently but sound the same. For example, you can see that C♯ and D♭ are enharmonically equivalent, as seen in **Examples 5** and **6**. **Example 6** also shows that the note D is enharmonically equivalent with the notes C𝄪 and E𝄫. In other words, playing a D, C𝄪, or E𝄫 will result in the same pitch.

Online Resources

- Tutorial on Half and Whole Steps (Music Theory Fundamentals)
- Tutorial on Half Steps, Whole Steps, and Accidentals (musictheory.net)
- Game to Practice Half Steps, Whole Steps, and Accidentals (drawmusic.com)
- Tutorial on Accidentals (mymusictheory.com)
- Tutorial on the Black Keys on the Piano (musicradar.com)
- Practicing the Piano Keyboard (musictheory.net)
- Matching Game for Piano Key Notes (quizlet.com)
- Labeling Game for Piano Key Notes (quizlet.com)
- Tutorial on Enharmonic Equivalence (The Music Notation Project)

Assignments on the Internet

A. Half and Whole Steps on the Piano Keyboard and in Staff Notation (.pdf)
B. Half and Whole Steps in Staff Notation (.pdf)

C. Writing and Identifying Notes with Accidentals, p. 1 (.pdf), pp. 9–11 (.pdf)
D. Keyboard to Staff Notation Matching (.pdf)
E. Enharmonic Equivalence, p. 3 (.pdf), (.pdf)

Assignments

1. Black Keys on the Piano (.pdf, .docx)
2. Half and Whole Steps on the Piano Keyboard (.pdf, .docx)
3. Writing Accidentals (.pdf, .docx)
4. Writing and Identifying Accidentals (.pdf, .docx)
5. Half and Whole Steps in Staff Notation (.pdf, .docx)
6. Enharmonic Equivalence (.pdf, .docx)

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- Correct and Incorrect Accidentals © Sarah Louden is licensed under a CC BY-SA (Attribution ShareAlike) license
- Piano Black Keys © Sarah Louden is licensed under a CC BY-SA (Attribution ShareAlike) license
- Piano Double Accidentals © Sarah Louden is licensed under a CC BY-SA (Attribution ShareAlike) license

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SECTION OVERVIEW

1.6: American Standard Pitch Notation (ASPN)

Key Takeaways

- **American Standard Pitch Notation (ASPN)** provides labels for specific musical frequencies by combining a note name (such as C) with a subscript octave designation (such as 4).
- A **pitch** is a discrete tone with an individual frequency (e.g. C_4), while a **pitch class** is less specific (e.g., C in general).
- ASPN differentiates between **octaves**, from C to B. The octaves are labeled from lowest to highest, beginning with 0 and continuing in ascending numerical order (1, 2, etc.).
- A piano keyboard primarily uses the ASPN octave designations 1 through 7, although small portions of octaves 0 and 8 are included.
- **Middle C** is C_4 in ASPN. It is helpful to memorize the ASPN label of this note as a starting point.

American Standard Pitch Notation and Pitch versus Pitch Class

In order to discuss specific notes, or **pitches**, we will use American Standard Pitch Notation, abbreviated **ASPN**. ASPN designates specific musical pitches by combining a note name (such as C) with a subscript **octave** designation (such as 4), creating a bipartite label (for example, C_4). ASPN labels are very useful, since they can identify every possible musical note within human hearing range, from the lowest pitches to the highest.

The Reading Clefs chapter introduced **octave equivalence**, the concept that explains why notes one or more octaves apart have the same letter name. Music theorists distinguish between a pitch, a discrete tone with an individual frequency (e.g. C_4 using ASPN), versus a **pitch class**, which is less specific (e.g., C in general). A pitch class includes all the pitches with the same letter name, in any octave, along with their enharmonic equivalents. For example, all Cs are the same pitch class, and the enharmonically equivalent notes D𝄫 and B♯ are also part of the C pitch class. In this chapter we are naming specific pitches with ASPN.

ASPN and Octave Designations

ASPN differentiates between **octaves**, beginning with the pitch C and ending with the pitch B. This means that each new octave designation begins on the note C, as seen in **Example 1**. The octaves are labeled from lowest to highest, beginning with 0 and continuing in numerical order (1, 2, 3, etc.). The pitch **middle C** is C_4, which is useful to memorize.

Nine different octaves are shown in the treble and bass clefs, each beginning and ending with the pitch "C." They are labeled with their ASPN label; C0, C1, C2, etc.

Example 1. *ASPN octave designations; each octave begins with the pitch C.*

All letter names within an octave (below the C of the next octave) receive the same octave designation. For example, all of the notes in **Example 2** would be designated in the 4 octave, because they are above C_4 but below C5. Accidentals applied to a note do not have an effect on its ASPN number. For example, $B\sharp_3$ and C_4 have different octave numbers despite being enharmonically equivalent, because the B♯ is still considered part of the lower octave.

The notes C, D, E, F, G, A, and B in a treble clef

Example 2. *The notes C_4, D_4, E_4, F_4, G_4, A_4, and B_4.*

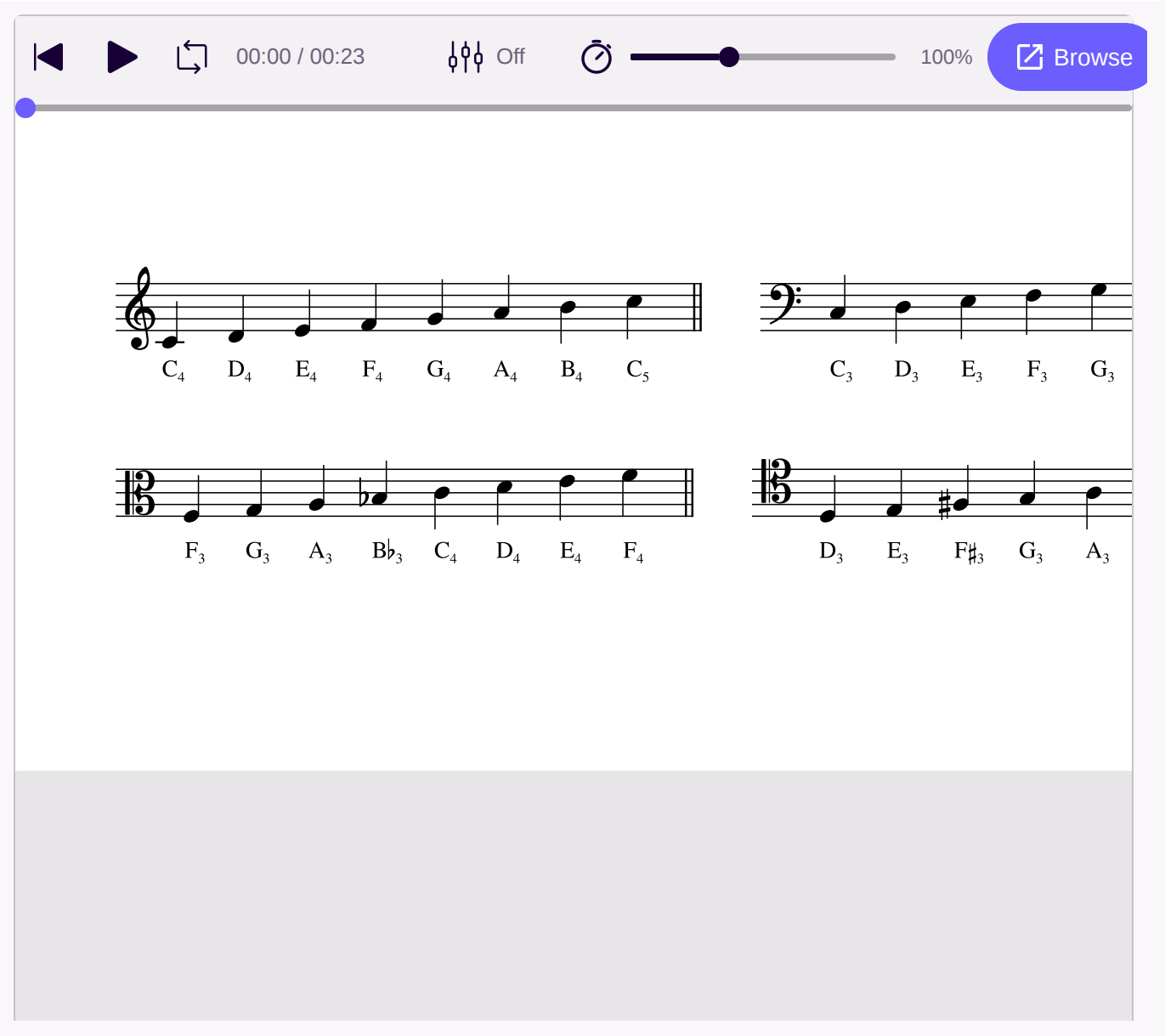
ASPN and the Keyboard

ASPN labels are very helpful for finding specific notes on the piano keyboard. **Example 3** depicts a piano keyboard with each octave labeled using ASPN notation. As you can see, the piano keyboard spans the full octaves 1 to 7. It also contains a small part of both octaves 0 and 8. ASPN labels are the same regardless of instrument or voice type. In other words, a C_4 will always be labeled as such regardless of whether it is produced with a flute, trombone, violin, or voice.

Example 3. *A piano keyboard with ASPN octave designations labeled; both colored notes (blue and yellow) fall into the octave 4 designation.*

ASPN and Staff Notation

Example 4 shows ASPN labels for common notes in the treble, bass, alto, and tenor clefs. Memorizing the location of C_4 in each clef can make finding ASPN labels quicker and easier.



Example 4. *ASPN labels for notes in four clefs.*

Online Resources

- "Pitches, Pitch Classes, Octave Designation, Enharmonic Equivalence" (YouTube)
- Tutorial on ASPN Octave Labels (liveabout.com)
- Tutorial on ASPN Octave Labels (flutopedia.com)
- Helpful Graphic with ASPN Labels on the Grand Staff and Piano (Music Theory Tips)
- Flash Cards with ASPN Labels in Treble and Bass Clefs (quizlet.com)

Assignments on the Internet

A. ASPN Labels and Staff Notation (.pdf)
B. ASPN Labels, pp. 23, 27, and 28 (.pdf)

Assignments

1. Writing and Identifying ASPN Labels (.pdf, .docx)

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SECTION OVERVIEW

1.7: Other Aspects of Notation

Key Takeaways

- **Dynamics** indicate the loudness of music. Musicians use a variety of Italian words to specify dynamics in Western musical notation.
- A **crescendo** indicates an increase in loudness, while a **decrescendo** or **diminuendo** indicates a decrease in loudness.
- The term **articulation** refers to the connection or separation between notes, as well as the accent level at the beginning of a note (its **attack**).
- A **tempo** indication tells a musician how fast or slow to play or sing a composition.
- Musicians **periodize** music into historical eras, which are useful to memorize. Works within these historical periods tend to share similar style characteristics.
- **Structural features** divide up a work or movement into smaller sections.

In this chapter we will explore other elements of music besides pitch (discussed in previous chapters) and duration (discussed in following chapters). These elements include dynamics, articulations, tempi, stylistic periods, and structural markers.

Dynamics

Dynamics indicate the loudness of music. In Western musical notation, we often use italicized Italian words, which can be abbreviated, to describe dynamics. The dynamic marking ***forte*** means loud, while ***piano*** means quiet. In sheet music, these words are written either above or below the staff.

Several Italian words and suffixes can modify *piano* and *forte* to create a range of dynamics from very quiet to very loud (**Example 1**). The Italian word ***mezzo*** means "moderately." Musicians say *mezzo forte* to mean moderately loud and *mezzo piano* to mean moderately quiet. The Italian suffix ***-issimo*** means "very" or "extremely." Musicians say *pianissimo* to mean "very quiet" and *fortissimo* to mean "very loud." This suffix can be stacked; for example, one can say *pianississimo* to mean "very, very quietly," or *fortississimo* to mean "very, very loudly."

Example 1. *Dynamics are arranged from quietest to loudest.*

Dynamics are often abbreviated in Western musical notation, as shown below.

- *fff = fortississimo*
- *ff = fortissimo*
- *f = forte*
- *mf = mezzo forte*
- *mp = mezzo piano*
- *p = piano*
- *pp = pianissimo*
- *ppp = pianississimo*

Some composers add even more "-*issimo*"s, but this is rare. However, you might one day spot a *pppppp* or an *ffffff* in music that you play or sing!

There are three other Italian words that are commonly used to indicate a change in dynamic level. **Crescendo** (*cresc*.) means to get louder, while **decrescendo** (*decresc*.) and **diminuendo** (*dim*.) both mean to get quieter. Crescendos and decrescendos are indicated two different ways: either by writing out the abbreviation *cresc*. or *decresc*., possibly followed by dots, or by drawing **hairpins**. The term "hairpin" refers to the following symbols, which roughly approximate the shape of a bobby pin (or "hairpin"), as seen in **Example 2.**

Example 2. *A crescendo and decrescendo ("hairpins").*

Articulations

The term **articulation** refers to the connection or separation between notes and to the accent level at the beginning of a note (its **attack**). Several articulations are demonstrated in **Examples 3–7**. Percussion instruments, plucked strings, bowed strings, winds, brass, and voices all have different methods of carrying out particular attacks and articulations. You will want to consult with a private teacher or ensemble director for help with applying different articulations to your instrument or voice.

Example 3: **Legato** means to play or sing smoothly or connected. This articulation is indicated by a curved **slur** marking.

Example 4: Another way to indicate smooth, connected playing is with **tenuto** markings, which look like a small line above or below notes.

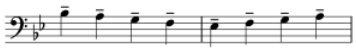
Example 5: **Staccato** means to play or sing notes more separated, leaving space between notes. This articulation is usually indicated by a dot placed above or below notes.

Example 6: An **accent** (a sideways V) means to play or sing a note with extra stress or emphasis.

Example 7: A **marcato** marking (an upside-down V) means to play or sing a note with a more forceful accent.

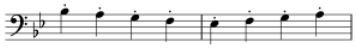
notation
https://viva.pressbooks.pub/app/uplo.../02/a-slur.mp3

Example 3. *Slurred notes.*



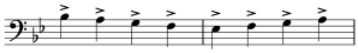
https://viva.pressbooks.pub/app/uplo...2/b-tenuto.mp3

Example 4. *Tenuto notes.*



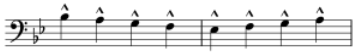
https://viva.pressbooks.pub/app/uplo...c-staccato.mp3

Example 5. *Staccato notes.*



https://viva.pressbooks.pub/app/uplo...2/d-accent.mp3

Example 6. *Accented notes.*



https://viva.pressbooks.pub/app/uplo.../e-marcato.mp3

Example 7. *Marcato notes.*

Accented notes can also be indicated by the italicized abbreviations *sfz*, *sf*, or *fz* (*sforzando*, *forzando*, or *forzato*). These accents are usually interpreted to be slightly more forceful (i.e., louder) than regular accents. These symbols work like dynamics and are placed directly above or below the note to which they apply.

Tempo

Tempo (plural tempi) is the term for how fast or slow a composition is performed. Tempi are usually indicated either specifically, by a metronome marking, or less specifically, by a textual indication. A **metronome marking** is usually indicated in beats per minute (BPM). A work that is marked ♩ = 60 would contain 60 quarter notes in one minute (one quarter note per second). With a free metronome application (such as Pro Metronome) on your phone, you can easily check the tempo of a work you're playing or singing.

Like dynamics, most tempo markings are written in Italian. They often appear at the beginning of a work, movement, or section, at the top left of the first staff or system. The most common tempi are as follows:

- Fast tempi: vivace, presto, allegro, allegretto (-etto is an Italian suffix meaning "little")
- Medium tempi: moderato, andante
- Slow tempi: adagio, largo, lento, grave

Example 8 depicts tempi from the slowest to the fastest.

Example 8. *Tempi are arranged from slowest to fastest.*

Composers sometimes use additional Italian words, especially emotive expressions, to modify a tempo marking. Words like *assai* ("very" or "rather"), *espressivo* ("expressively"), or *cantabil*e ("singingly") frequently appear after tempo markings, especially in

works written after the year 1800. For example, one might come across tempo markings like “allegro assai” (“very fast”), “andante cantabile” (“a moderate tempo, singingly”), or “adagio espressivo” (“slow and expressive”). Always be sure to look up the definition of any words that you do not know in your music.

Two other Italian words are commonly used to indicate changes in tempo: **ritardando** (*rit.*) for a gradual decrease and **accelerando** (*accel.*) for a gradual increase. Both words are generally italicized, and they are often abbreviated (*rit*. and *accel*. respectively). When these directions are meant to apply to several measures, they are often followed by dots. The dots continue as long as the direction is meant to be followed.

Structural Features

The following words and symbols indicate **structural features** in compositions. Structural features divide up a work or movement into smaller sections.

- **Example 9**: A **fermata** indicates that a note should be held longer than its regular duration. Fermatas often appear at the start or end of a musical section.
- **Example 10**: A **caesura** indicates a break or a musical cutoff.
- **Example 11**: A **breath mark** indicates a breath for a wind instrumentalist or a vocalist. For percussionists, keyboardists, or string players, it indicates a pause similar in length to a breath.

Example6Chapter6.png

Example 9. *A note in treble clef with a fermata.*

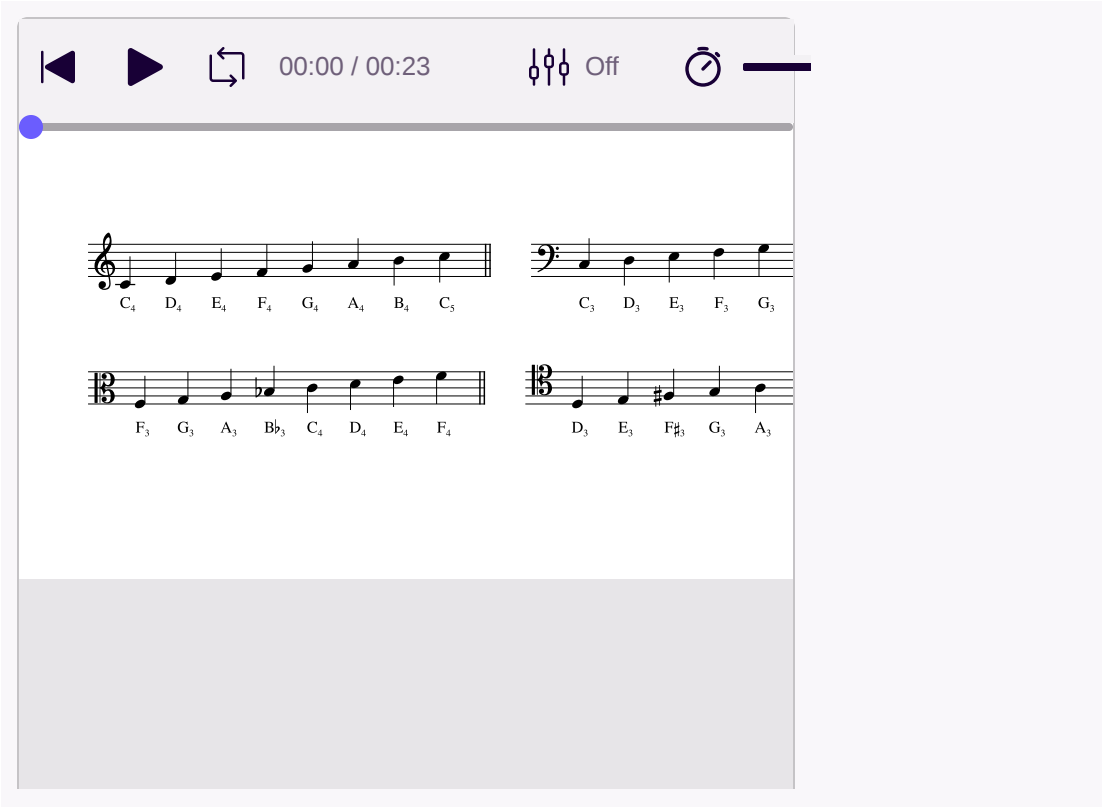
Example7Chapter6.png

Example 10. *A note in bass clef with a caesura after it.*

Example8Chapter6.png

Example 11. *A note in alto clef with a breath mark after it.*

Repeat signs indicate that a section of music should be repeated (**Example 12**). If the repeated section ends differently each time, that is indicated with first and second endings (**Example 13**).



Sheet music by openmusictheory

CHAPTER OVERVIEW

2: Unit 2- Basics of Rhtythm

2.1: Rhythmic and Rest Values
2.2: Simple Meter and Time Signatures
2.3: Compound Meter and Time Signatures
2.4: Other Rhythmic Essentials

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SECTION OVERVIEW

2.1: Rhythmic and Rest Values

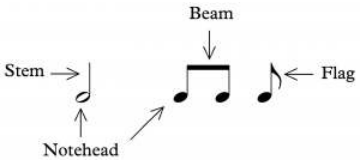
Key Takeaway

- **Notes** consist of several different components, including a **notehead**, **stem**, **beam**, and **flag**.
- Common note values include the **whole note**, **half note**, **quarter note**, **eighth note**, and **sixteenth note**.
- Common rest values include the **whole rest**, **half rest**, **quarter rest**, **eighth rest**, and **sixteenth rest**.
- British terms for note and rest values are different from American terms.
- A **dot** increases the duration of a note by half. Subsequent dots add half the duration of the previous dot.
- A **tie** connects two or more notes of the same pitch. Do not rearticulate any "tied to" notes.

Music is a **temporal** art—in other words, time is one of its components—so organizing time is essential for Western musical notation. The next several chapters will focus on the temporal facets of **rhythm** and **meter**, starting in this chapter with the basic rhythmic and rest values in this notation system.

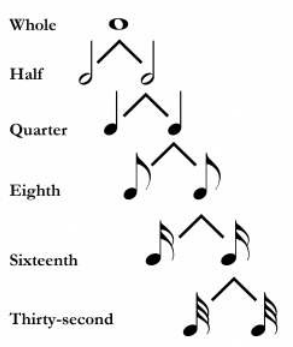
Rhythmic Values

Broadly speaking, rhythm refers to the duration of musical sounds and rests in time. As you'll recall in the chapter titled Notation of Notes, Clefs, and Ledger Lines, notes may contain several different components, as seen in **Example 1**:



Example 1. *Noteheads with stems, beams and flags labeled.*

There are many common **rhythmic values** in Western musical notation. Rhythmic values are **hierarchical**; in other words, their lengths are relative to one another. Each rhythmic value can be divided into two subsequent rhythmic values, as seen in **Example 2**. Just as a whole pizza divides into two halves, four quarters, eight eighths, etc., a whole note divides into two half notes, four quarter notes, eight eighth notes, and so on.



Example 2. *The relative relationships between common rhythmic values.*

Several additional aspects of **Example 2** should be noted:

- Noteheads can be filled in (black) or unfilled (white); quarter notes and shorter durations are filled in.
- Unfilled noteheads may or may not have a stem, but filled noteheads always have stems.
- Flags are only added to the stems of filled noteheads.

Additionally, there are three ways to decrease a note's value duration by half:

- Adding a stem to a note (i.e., whole to half)

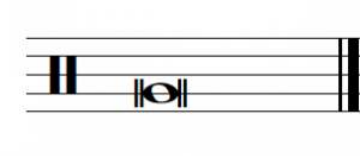
- Filling in a notehead (i.e., half to quarter)
- Adding a flag (i.e., quarter to eighth or eighth to sixteenth)

Open Music Theory privileges the North American names for rhythmic values, but it's worth being familiar with the British names as well (indicated in parentheses below). See **Example 2** for a visual of each note value.

- **Whole note (semibreve in British English):** this thick, unfilled oval shape has no stem. In many compositions today, this is the longest note value used.
- **Half note (minim in British English):** also an oval, drawn with a slightly thinner line, and has a stem. This note is half as long as the whole note (i.e., two half notes make up one whole note).
- **Quarter note (crotchet in British English):** looks like the half note, except that the notehead has been filled in. This note is half as long as a half note (i.e., two quarter notes make up one half note) and a quarter as long as a whole note (i.e., four quarter notes make up one whole note).
- **Eighth note (quaver in British English):** looks like the quarter note, except that a flag has been added to its stem. This note is half as long as a quarter note (i.e., two eighth notes make up one quarter note) and an eighth as long as a whole note (i.e., eight eighth notes make up one whole note).
- **Sixteenth note (semiquaver in British English):** looks like an eighth note, except that it has an extra flag. This note is half as long as an eighth note (i.e., two sixteenth notes make up one eighth note) and one sixteenth as long as a whole note (i.e., sixteen sixteenth notes make up one whole note).

Symbol	American name	British name
𝅝	Whole note	Semibreve
𝅗𝅥	Half note	Minim
♩	Quarter note	Crotchet
♪	Eighth note	Quaver
𝅘𝅥𝅯	Sixteenth note	

Note values shorter than the sixteenth note (thirty-second note, sixty-fourth note, etc.) are created by adding extra flags. You may run into one additional, less common rhythmic value called the **double whole note** (breve in British English; **Example 3**). Double whole notes are sometimes notated with only one line on either side of the notehead. In older musical notation styles, the notehead appears more square than oval. Double whole notes divide into whole notes (i.e., two whole notes make up one double whole note).

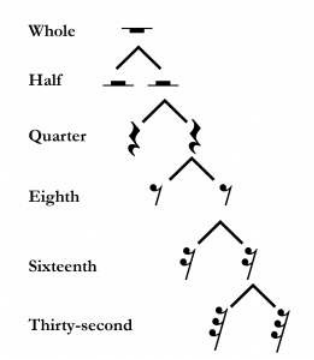


Example 3. *A double whole note on a line.*

Rest Values

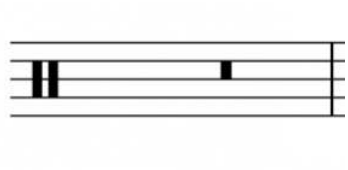
Broadly speaking, **rests** refer to the duration of silences in music. Each hierarchical rhythmic value has a corresponding rest value, as seen in **Example 4**. Like rhythmic note values, each rest value can be divided into two subsequent rest values. Several additional aspects of **Example 4** should be noted:

- Notice that a whole rest hangs down from a line while a half rest sits on top of a line. It may be helpful to think of a whole rest as "heavier" than a half rest to remember that it hangs down; likewise, a half rest resembles a top hat, so you can think of it as sitting on top of a line as if on a person's head.
- Practice drawing quarter rests carefully; many students find them difficult to draw.
- Adding a flag to a rest (i.e., eighth to sixteenth) decreases a rest's duration by half.



Example 4. *The relative relationships between common rest values.*

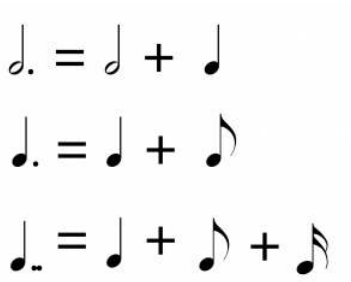
Although rare, you may run across a breve rest (**Example 5**). A breve rest is equivalent in length to two whole rests. It looks like a filled-in box and appears on the second space from the top.



Example 5. *A breve rest.*

Dots and ties

Dots and ties allow rhythmic and rest durations to be lengthened. A **dot** is written immediately after a note or rest, and it increases its duration by half (**Example 6**). For example, a quarter note is equivalent in duration to two eighth notes; therefore, a dotted quarter note would be equivalent to *three* eighth notes. Similarly, a whole note is equivalent to two half notes, so a dotted whole note would be equivalent to *three* half notes. Multiple dots can be added to a duration, with each subsequent dot adding half the duration of the previous one. For example, a double-dotted quarter note (i.e., a quarter note with two dots) is equivalent in duration to a quarter note, eighth note, and sixteenth note added together. In other words, a double-dotted note is 1¾ the durational value of the original note.



Example 6. *The rhythmic breakdown of two dotted notes and one double-dotted note.*

A **tie** is a curved line that connects two or more notes with the same pitch. Tied-to notes are not rearticulated. In other words, ties are used to increase a rhythmic or rest value. The tie connecting the first two rhythmic values in **Example 7** indicates that when these half and quarter notes are played or sung, the quarter note should not be articulated; in other words, the first note should be held for the duration of three quarter notes instead of two. Another way to write this rhythmic value is as a dotted half note.

https://musescore.com/static/musesco...che=1623333381

Example 7. *A tie connects the first two notes.*

You would be correct to think that a tie looks like a **slur** (see Other Aspects of Notation). The difference between the two is that slurs connect notes of different pitches and indicate to play or sing the notes **tenuto**, while ties connect notes of the same pitch to create a note with a longer rhythmic value.

Online Resources

- Note Durations (musictheory.net)
- Rhythmic Values (learnmusictheory.net)
- Note Values (Essentials of Harmony)
- Dots and Ties (YouTube)
- Dots and Ties (musictheory.net)

Assignments on the Internet

A. Rhythmic Equations with Whole and Half Notes (.pdf)
B. Rhythmic Equations with Half, Quarter, and Eighth Notes (.pdf)
C. Rhythmic Equations with Quarter and Eighth Notes (.pdf)
D. Rhythmic Equations with Quarter, Eighth, and Sixteenth Notes (.pdf)
E. Writing Notes and Rests, Rhythmic Equations, pp. 3–7 (.pdf)
F. Advanced Rhythmic Equations, p. 3 (.pdf)
G. Slurs and Ties (.pdf)

Assignments

1. Note and Rest Values (.pdf, .docx)
2. Dots and Ties (.pdf, .docx)

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SECTION OVERVIEW

2.2: Simple Meter and Time Signatures

Key Takeaways

- A **beat** is a pulse in music that regularly recurs.
- **Simple meters** are meters in which the beat divides into two, and then further subdivides into four.
- **Duple meters** have groupings of two beats, **triple meters** have groupings of three beats, and **quadruple meters** have groupings of four beats.
- There are different conducting patterns for duple, triple, and quadruple meters.
- A **measure** is equivalent to one group of beats (duple, triple, or quadruple). Measures are separated by **bar lines**.
- **Time signatures** in simple meters express two things: how many beats are contained in each measure (the top number), and the **beat unit** (the bottom number), which refers to the note value that is the beat.
- A **beam** visually connects notes together, grouping them by beat. Beaming changes in different time signatures.
- Notes below the middle line on a staff are up-stemmed, while notes above the middle line on a staff are down-stemmed. **Flag** direction works similarly.

CHAPTER PLAYLIST

In Rhythmic and Rest Values, we discussed the different rhythmic values of **notes** and **rests**. Musicians organize rhythmic values into various **meters**, which are—broadly speaking—formed as the result of recurrent patterns of accents in musical performances.

Terminology

Listen to the following performance by the contemporary musical group Postmodern Jukebox (**Example 1**). They are performing a cover of the song "Wannabe" by the Spice Girls (originally released in 1996). Beginning at 0:11, it is easy to tap or clap along to this recording. What you are tapping along to is called a **beat**—a pulse in music that regularly recurs.

Example 1. *A cover of "Wannabe" performed by Postmodern Jukebox; listen starting at 0:11.*

Example 1 is in a **simple meter**: a meter in which the beat divides into two, and then further subdivides into four. You can feel this yourself by tapping your beat twice as fast; you might also think of this as dividing your beat into two smaller beats.

Different numbers of beats group into different meters. **Duple meters** contain beats that are grouped into twos, while **Triple meters** contain beats that are grouped into threes, and **Quadruple meters** contain beats that are grouped into fours.

Listening to Simple Meters

Let's listen to examples of simple duple, simple triple, and simple quadruple meters. A **simple duple** meter contains two beats, each of which divides into two (and further subdivides into four). "The Stars and Stripes Forever" (1896), written by John Philip

Sousa, is in a simple duple meter.

Listen to **Example 2**, and tap along, feeling how the beats group into sets of two:

Example 2. *"The Stars and Stripes Forever" played by the Dallas Winds.*

A **simple triple** meter contains three beats, each of which divides into two (and further subdivides into four). Wolfgang Amadeus Mozart's "Minuet in F major," K.2 (1774) is in a simple triple meter. Listen to **Example 3**, and tap along, feeling how the beats group into sets of three:

Example 3. *Mozart's "Minuet in F major," played by Alan Huckleberry.*

Finally, a **simple quadruple** meter contains four beats, each of which divides into two (and further subdivides into four). The song "Cake" (2017) by Flo Rida is in a simple quadruple meter. Listen to **Example 4** starting at 0:45 and tap along, feeling how the beats group into sets of four:

Example 4. *"Cake" by Flo Rida; listen starting at 0:45.*

As you can hear and feel (by tapping along), musical compositions in a wide variety of styles are governed by meter. You might practice identifying the meters of some of your favorite songs or musical compositions as simple duple, simple triple, or simple quadruple; listening carefully and tapping along is the best way to do this. Note that simple quadruple meters feel similar to simple duple meters, since four beats can be divided into two groups of two beats. It may not always be immediately apparent if a work is in a simple duple or simple quadruple meter by listening alone.

Conducting Patterns

If you have ever sung in a choir or played an instrument in a band or orchestra, then you have likely had experience with a **conductor**. Conductors have many jobs. One of these jobs is to provide **conducting patterns** for the musicians in their choir, band, or orchestra. Conducting patterns serve two main purposes: first, they establish a tempo, and second, they establish a meter.

The three most common conducting patterns outline duple, triple, and quadruple meters. Duple meters are conducted with a downward/outward motion (step 1), followed by an upward motion (step 2), as seen in **Example 5**. Triple meters are conducted with a downward motion (step 1), an outward motion (step 2), and an upward motion (step 3), as seen in **Example 6**. Quadruple meters are conducted with a downward motion (step 1), an inward motion (step 2), an outward motion (step 3), and an upward motion (step 4), as seen in **Example 7**:

Example 5. *A duple conducting pattern.* ***Example 6.*** *A triple conducting pattern.* ***Example 7.*** *A quadruple conducting pattern.*

Beat 1 of each of these measures is considered a **downbeat**. A downbeat is conducted with a downward motion, and you may hear and feel that it has more "weight" or "heaviness" then the other beats. An **upbeat** is the last beat of any measure. Upbeats are conducted with an upward motion, and you may feel and hear that they are anticipatory in nature.

Example 8 shows a short video demonstrating these three conducting patterns:

Example 8. *Dr. John Lopez (Texas A&M University, Kingsville) demonstrates duple, triple, and quadruple conducting patterns.*

You can practice these conducting patterns while listening to **Example 2** (duple), **Example 3** (triple), and **Example 4** (quadruple) above.

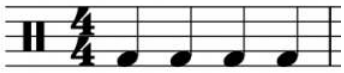
Time Signatures

In Western musical notation, beat groupings (duple, triple, quadruple, etc.) are shown using bar lines, which separate music into measures (also called bars), as shown in **Example 9**. Each measure is equivalent to one beat grouping.

Example 9. *Bar lines and measures.*

In simple meters, **time signatures** (also called meter signatures) express two things: 1) how many beats are contained in each measure, and 2) the beat unit (which no

value gets the beat). Time signatures are expressed by two numbers, one above the other, placed after the clef (**Example 10**).



Example 10. *The two numbers (4 and 4) form a time signature.*

A time signature is not a fraction, though it may look like one; note that there is no line between the two numbers. In simple meters, the top number of a time signature represents the number of beats in each measure, while the bottom number represents the beat unit.

In simple meters, the top number is always 2, 3, or 4, corresponding to duple, triple, or quadruple beat patterns. The bottom number is usually one of the following:

- 2, which means the half note gets the beat.
- 4, which means the quarter note gets the beat.
- 8, which means the eighth note gets the beat.

You may also see the bottom number 16 (the sixteenth note gets the beat) or 1 (the whole note gets the beat) in simple meter time signatures.

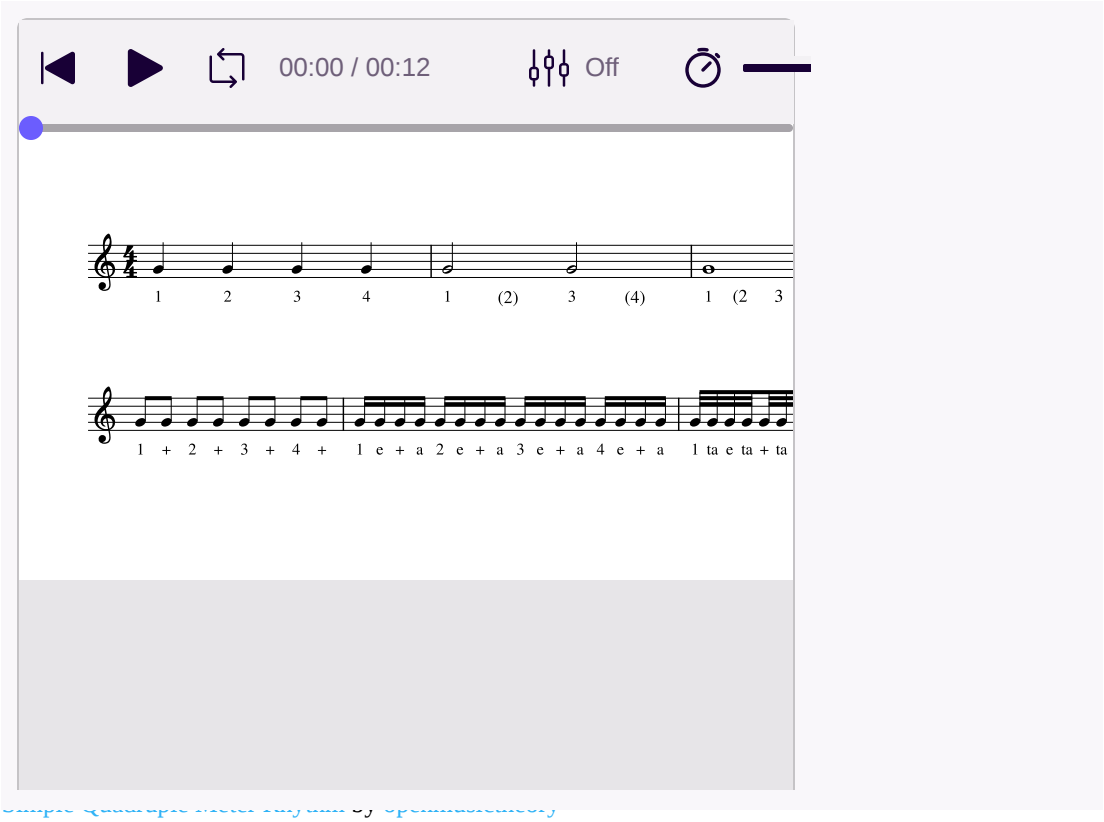
There are two additional simple meter time signatures, which are 𝄴 (common time) and 𝄵 (cut time). Common time is the equivalent of 4444 (simple quadruple—four beats per measure), while cut time is the equivalent of 2222 (simple duple—two beats per measure).

Counting in Simple Meter

Counting rhythms aloud is important for musical performance; as a singer or instrumentalist, you must be able to perform rhythms that are written in Western musical notation. Conducting while counting rhythms is highly recommended and will help you to keep a steady tempo. Please note that your instructor may employ a different counting system. *Open Music Theory* privileges American traditional counting, but this is not the only method.

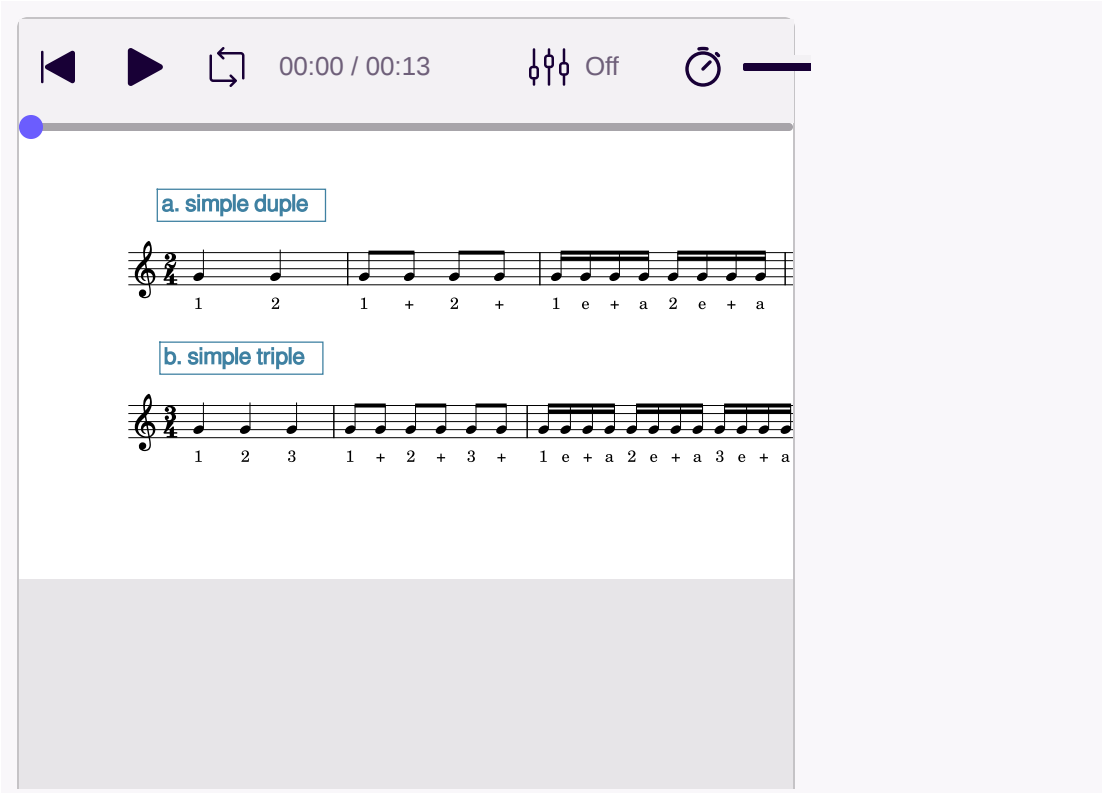
Example 11 shows a rhythm in a 4444 time signature, which is a simple quadruple meter. This time signature means that there are four beats per measure (the top 4) and that the quarter note gets the beat (the bottom 4).

- In each measure, each quarter note gets a count, expressed with **Arabic numerals**—"1, 2, 3, 4."
- When notes last longer than one beat (such as a half or whole note in this example), the count is held over multiple beats. Beats that are not counted out loud are written in parentheses.
- When the beat in a simple meter is divided into two, the divisions are counted aloud with the syllable "and," which is usually notated with the plus sign (+). So, if the quarter note gets the beat, the second eighth note in each beat would be counted as "and."
- Further subdivisions at the sixteenth-note level are counted as "e" (pronounced as a long vowel, as in the word "see") and "a" (pronounced "uh"). At the thirty-second-note level, further subdivisions add the syllable "ta" in between each of the previous syllables.



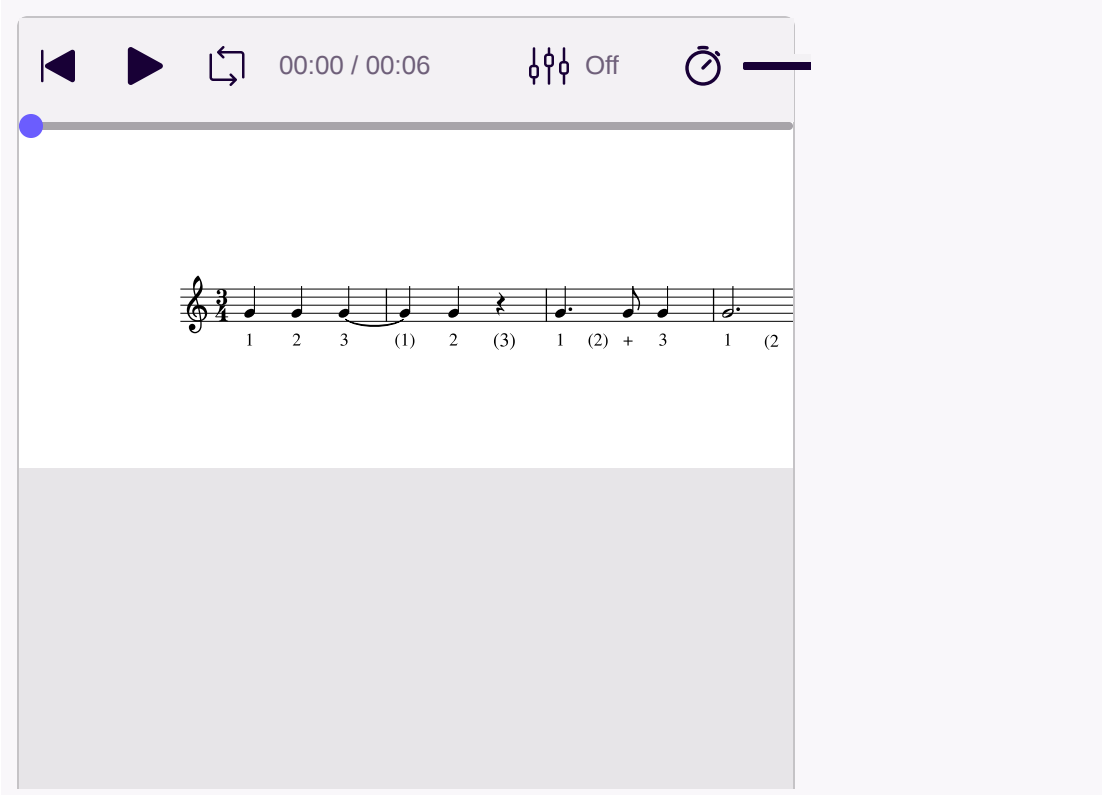
Example 11. *Rhythm in 4/4 time.*

Simple duple meters have only two beats and simple triple meters have only three, but the subdivisions are counted the same way (**Example 12**).



Example 12. *Simple duple meters have two beats per measure; simple triple meters have three.*

Example 12. *Simple duple meters have two beats per measure; simple triple meters have three.*



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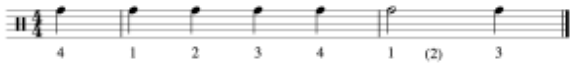
Example 13. *Beats that are not counted out loud are put in parentheses.*

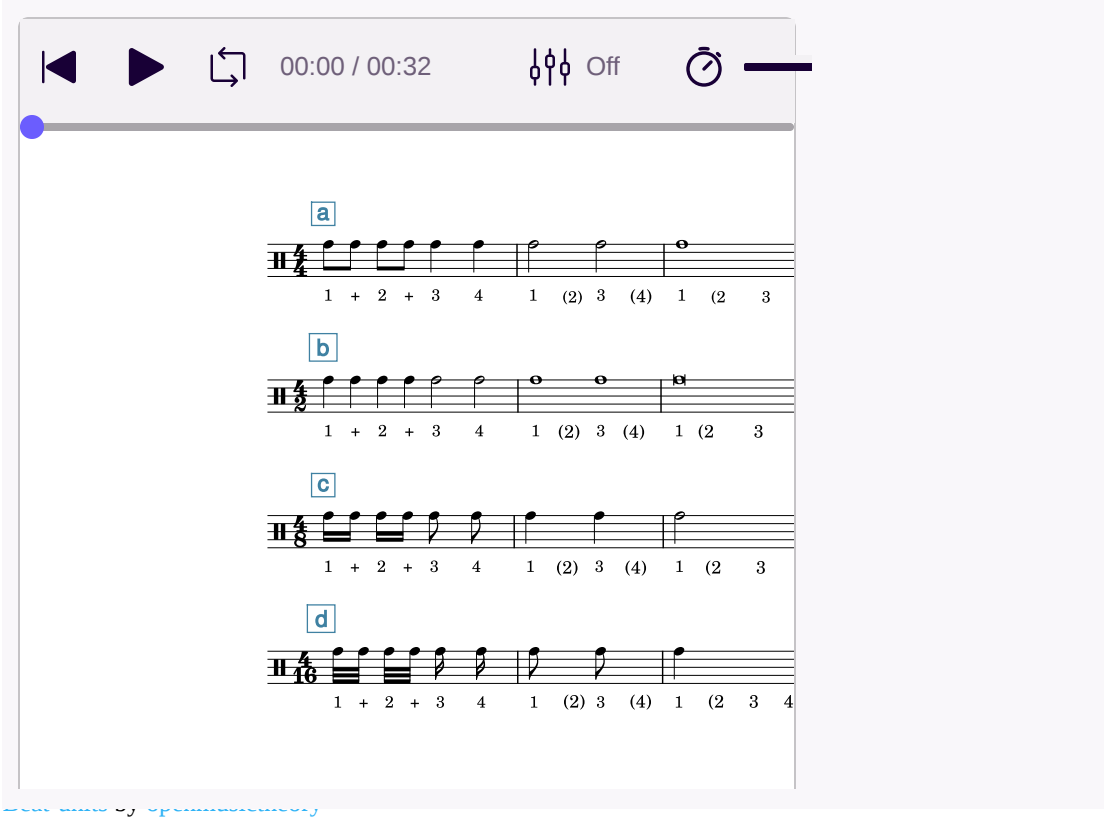


Example 14. *An anacrusis.*

When an example begins with a pickup note (**anacrusis**), your count will not begin on "1," as shown in **Example 14**. An anacrusis is counted as the last note(s) of an imaginary measure. When a work begins with an anacrusis, the last measure is usually shortened by the length of the anacrusis. This is demonstrated in **Example 14**: the anacrusis is one quarter note in length, so the last measure is only three beats long (i.e., it is missing one quarter note).

Counting with Beat Units of 2, 8, and 16

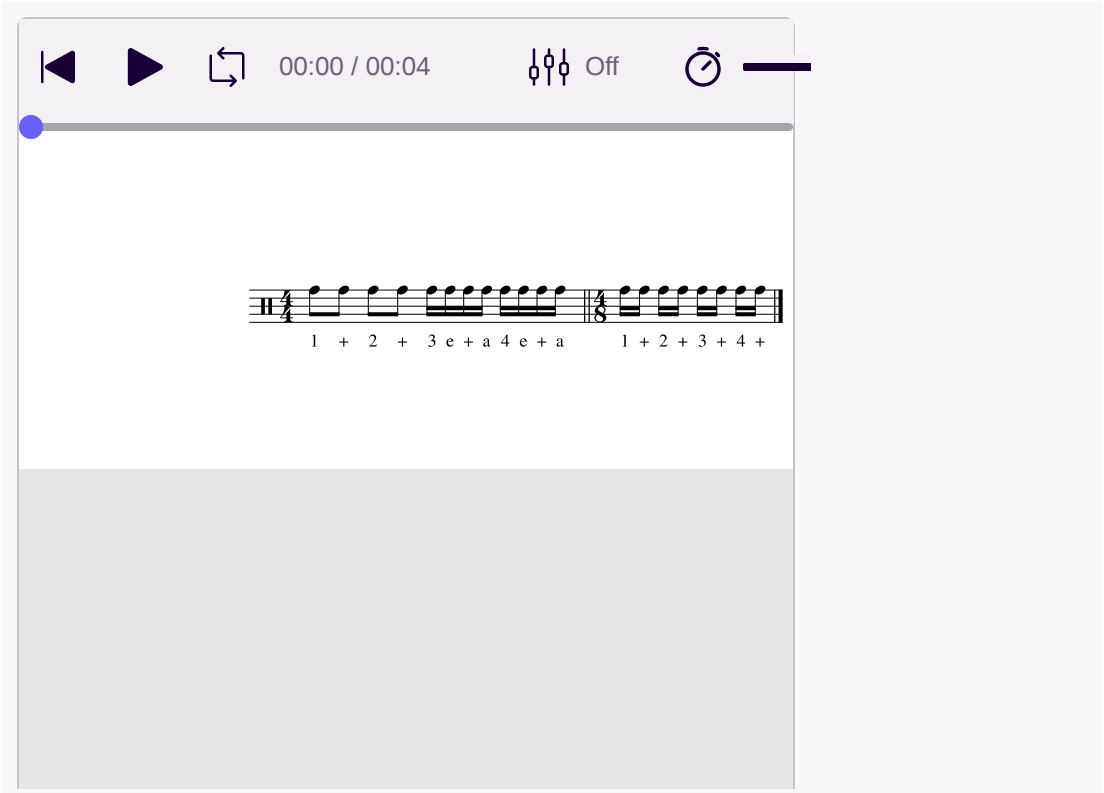
In simple meters with other beat units (shown in the bottom number of the time signature), the same counting patterns are used for the beats and subdivisions, but they correspond to different note values. **Example 15** shows a rhythm with a 4444 time signature, followed by the same rhythms with different beat units. Each of these rhythms sounds the same and is counted the same. They are also all considered simple quadruple meters. The difference in each example is the bottom number of the time signature—which note gets the beat unit (quarter, half, eighth, or sixteenth).



Example 15. *The same counted rhythm, as written in a meter with (a) a quarter-note beat, (b) a half-note beat, (c) an eighth-note beat, and (d) a sixteenth-note beat.*

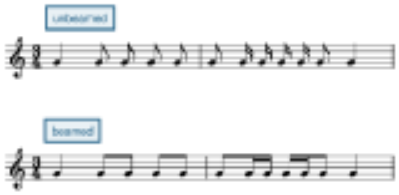
Beaming, Stems, Flags, and Multi-Measure Rests

Beams connect notes together by beat. As **Example 16** shows, this means that beaming changes depending on the time signature. In the first measure, sixteenth notes are grouped into sets of four, because four sixteenth notes in a 4444 time signature are equivalent to one beat. In the second measure, however, sixteenth notes are grouped into sets of two, because one beat in a 4884 time signature is only equivalent to two sixteenth notes.



Beaming in Two Different Meters by OpenMusicTheory

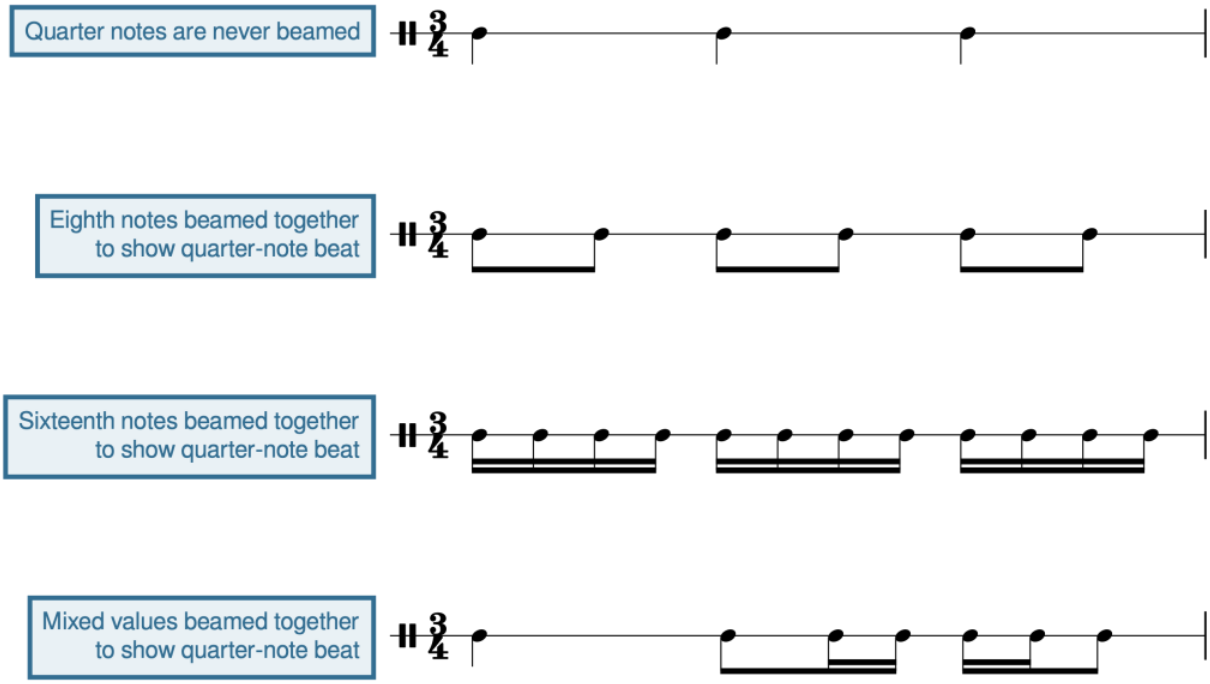
Example 16. *Beaming in two different meters.*



Example 17. *Beaming makes rhythms easier to read by showing the beat unit.*

Note that in vocal music, beaming is sometimes only used to connect notes sung on the same syllable. If you are accustomed to music without beaming, you may need to pay special attention to beaming conventions until you have mastered them. In the top staff of **Example 17**, the eighth notes are not grouped with beams, making it difficult to see where beats 2 and 3 in the triple meter begin. The bottom staff shows that if we re-notate the rhythm so that the notes that fall within the same beat are grouped together with a beam, it makes the music much easier to read. Note that these two rhythms sound the same, even though they are beamed differently. The ability to group events according to a hierarchy is an important part of human perception, which is why beaming helps us visually parse notated musical rhythms—the metrical structure provides a hierarchy that we show using notational tools like beaming.

Example 18 shows several different note values beamed together to show the beat unit. The first line does not require beams because quarter notes are never beamed, but all subsequent lines do need beams to clarify beats.



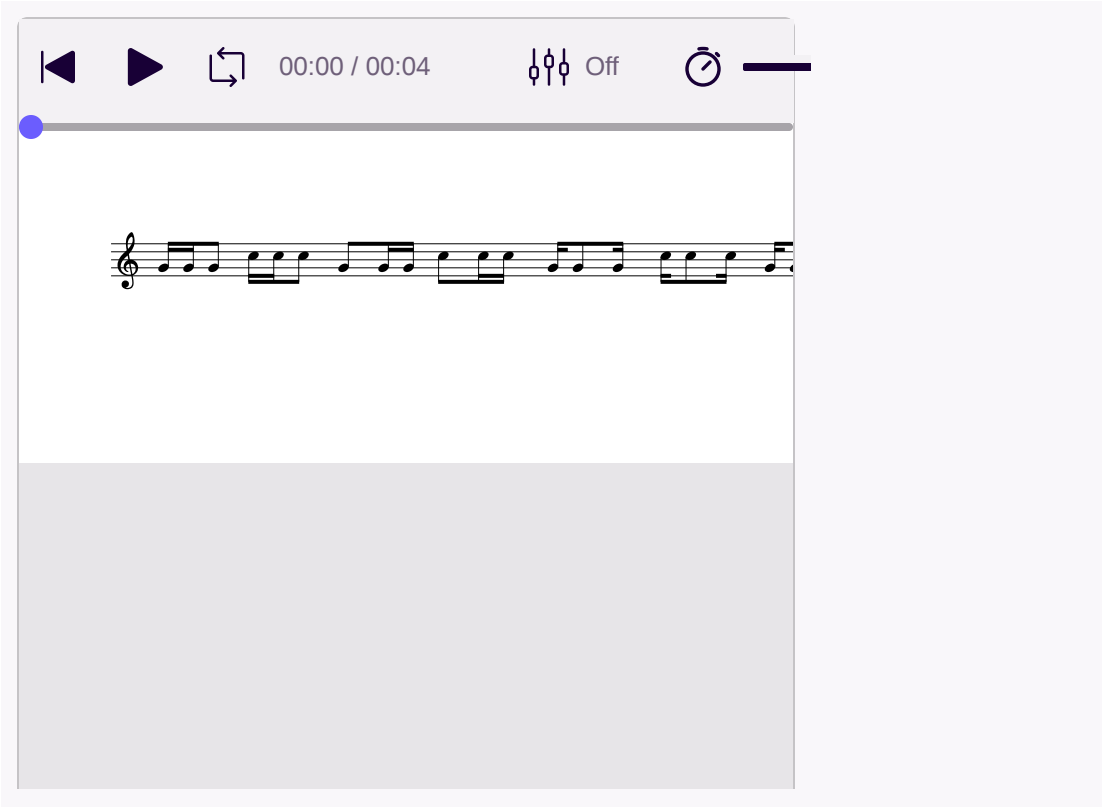
Example 18. *Note values can be beamed together to show the beat unit. In* 3443*, eighth and sixteenth notes can be beamed together to show a quarter-note beat.*

The second measure of **Example 19** shows that when notes are grouped together with beams, the stem direction is determined by the note farthest from the middle line. On beat 1 of measure 2, this note is E_5, which is above the middle line, so down-stems are used. Beat 2 uses up-stems because the note farthest from the middle line is the E_4 below it.

Flagging is determined by stem direction (**Example 20**). Notes above the middle line receive a down-stem (on the left) and an inward-facing flag (facing right). Notes below the middle line receive an up-stem (on the right) and an outward-facing flag (facing left). Notes on the middle line can be flagged in either direction, usually depending on the contour of the musical line.

Example 20. *Flagging is determined by stem direction*

Partial beams can be used for mixed rhythmic groupings, as shown in **Example 21**. Sometimes these beaming conventions look strange to students who have had less experience with reading beamed music. If this is the case, you will want to pay special attention to how the notes in **Example 21** are beamed.



Partial beams by openmusictheory

Example 21. *Partial beams are used for some mixed rhythmic groupings.*

Rests that last for multiple full measures are sometimes notated as seen in **Example 22**. This example indicates that the musician is to rest for a duration of four full measures.

Example 22. *A multi-measure rest lasting four measures.*

A Note on Ties

We have already encountered ties that can be used to extend a note over a measure line. But ties can also be used like beams to clarify the metrical structure within a measure. In the first measure of **Example 23**, beat 2 begins in the middle of the eighth note, making it difficult to see the metrical structure. Breaking the eighth note into two sixteenth notes connected by a tie, as shown in the second measure, clearly shows the beginning of beat 2.

Example 23. *Ties and proper beaming help to clarify beats.*

Online Resources

- Simple Meter Tutorial (musictheory.net)
- Video Tutorial on Simple Meter, Beats, and Beaming (YouTube)
- Conducting Patterns (YouTube)

- Simple Meter Time Signatures (liveabout.com)
- Video Tutorial on Counting Simple Meters (One Minute Music Lessons)
- Simple Meter Counting (YouTube)
- Beaming Rules (Music Notes Now)
- Beaming Examples (Dr. Sebastian Anthony Birch)

Assignments from the Internet

A. Time Signatures and Rhythms (.pdf)
B. Terminology, Bar Lines, Fill-in-rhythms, Re-beaming (.pdf)
C. Meters, Time Signatures, Re-beaming (website)
D. Bar Lines, Time Signatures, Counting (.pdf)
E. Time Signatures, Re-beaming, p. 4 (.pdf)
F. Fill-in-rhythms (.pdf)
G. Time Signatures (.pdf, .pdf)
H. Bar Lines (.pdf, .pdf, .pdf)

Assignments

1. Notes, Rests, Bar Lines (.pdf, .docx)
2. Re-beaming (.pdf, .musx)

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- Notes Without Beams © Mark Gotham is licensed under a CC BY-SA (Attribution ShareAlike) license
- beaming-beat-unit © Megan Lavengood is licensed under a CC BY-SA (Attribution ShareAlike) license
- Stemming © Chelsey Hamm is licensed under a CC BY-SA (Attribution ShareAlike) license
- Flag Direction © Chelsey Hamm is licensed under a CC BY-SA (Attribution ShareAlike) license
- Multi-Measure Rest © Chelsey Hamm is licensed under a CC BY-SA (Attribution ShareAlike) license
- ties-clarify-beat © Mark Gotham is licensed under a CC BY-SA (Attribution ShareAlike) license

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SECTION OVERVIEW

2.3: Compound Meter and Time Signatures

Key Takeaways

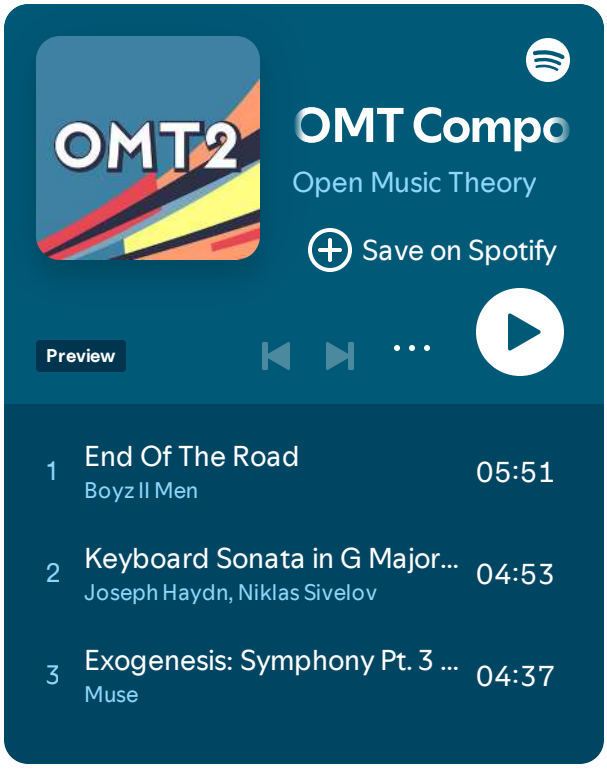
- **Compound meters** are meters in which the beat divides into three and then further subdivides into six.
- **Duple meters** have groupings of two beats, **triple meters** have groupings of three beats, and **quadruple meters** have groupings of four beats. You can determine these groupings aurally by listening carefully and tapping along to the beat.
- There are different conducting patterns for duple, triple, and quadruple meters; these are the same in both compound and simple meters.
- **Time signatures** in compound meters express two things: how many divisions are contained in each measure (the top number), and the **division unit**—which note gets the division (the bottom number).
- Rhythms in compound meters get different counts based upon their division unit. Beats that are not articulated (because they contain more than one beat or because of ties, rests, or dots) receive parentheses around their counts.

CHAPTER PLAYLIST

In the previous chapter, Simple Meter and Time Signatures, we explored rhythm and time signatures in **simple meters**—meters in which the beat divides into two and further subdivides into four. In this chapter, we will learn about **compound meters**—meters in which the beat divides into three and further subdivides into six.

Listening to and Conducting Compound Meters

Compound meters can be **duple**, **triple**, or **quadruple**, just like simple meters. In other words, the beats of compound meters group into sets of either two, three, or four. The difference is that each beat divides into three divisions instead of two, as you can hear by listening carefully to the following examples:



- "End of the Road" (1992) by Boyz II Men is in a **duple meter**—the beats group into a two pattern. Tap along to the beat and notice how it divides into three parts instead of two. If you further divide the beat (by tapping twice as fast), you will feel that

the beat subdivides into six parts.

- The second movement (Minuet) of Franz Joseph Haydn's Sonata no. 42 in G Major (1784) is in a compound **triple meter**. Listen for the groupings of three beats, each of which divides into three.
- Finally, a compound **quadruple meter** contains four beats, each of which divides into three. Listen to "Exogenesis Symphony Part III" (2010) by the alternative rock band Muse. This is in a compound quadruple meter; in other words, the beats are grouped into a four pattern.

In general, it is less common for music to be written in compound meters. Nonetheless, you must learn how to read music and perform in these meters in order to master Western musical notation.

Review the conducting patterns for simple meters in the previous chapter, as they are the same for compound meters.

Time Signatures

Measures in compound meters are equivalent to one beat grouping (duple, triple, or quadruple), just as they are in simple meters. However, the two numbers in the **time signature** express different information for compound meters. The top number of a time signature in compound meter expresses the number of divisions in a measure, while the bottom number expresses the **division unit**—which note value is the division. **Example 1** shows a common compound-meter time signature.

Example 1. *Two numbers (6 and 8) form a common compound meter time signature.*

In compound meters, the top number is always a multiple of three. Divide this number by three to find the corresponding number of beats in simple meter: top numbers of 6, 9, and 12 correspond to duple, triple, and quadruple meters respectively. In compound meters, the bottom number is usually one of the following:

- 8, which means the eighth note receives the division.
- 4, which means the quarter note receives the division.
- 16, which means the sixteenth note receives the division.

The following table summarizes the six categories of meters that we have covered so far:

Simple or Compound?	Duple, Triple, Quadruple?	Beat Grouping	Beat Division	Example Time Signatures
Simple	Duple	2	2	242822216428222162
Simple	Triple	3	2	343832316438323163
Simple	Quadruple	4	2	444842416448424164
Compound	Duple	2	3	68646168646166
Compound	Triple	3	3	98949168949169
Compound	Quadruple	4	3	12812412168124121612

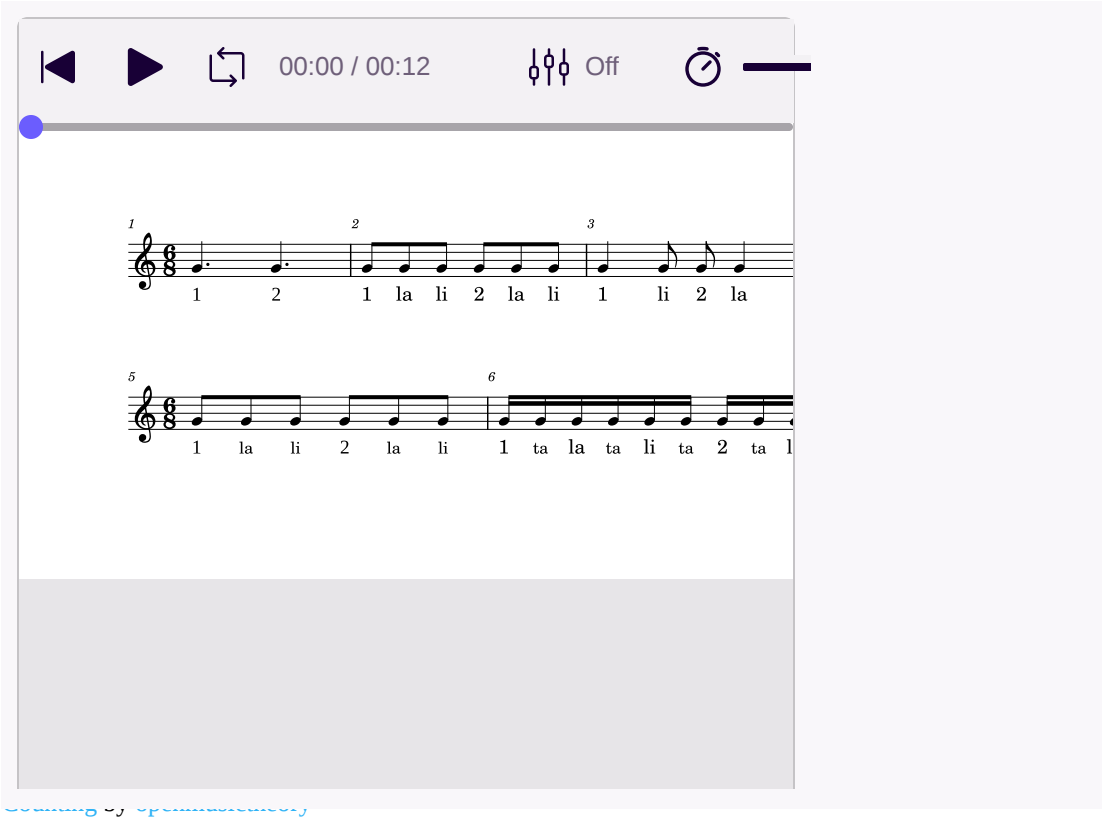
Example 2. *Categories of meters.*

Counting in Compound Meter

While counting compound meter rhythms, it is recommended that you conduct in order to keep a steady tempo. Because beats in compound meter divide into three, they are always dotted. Beats in compound meter are as follows:

- If 8 is the bottom number, the beat is a dotted quarter note (equivalent to three eighth notes).
- If 4 is the bottom number, the beat is a dotted half note (equivalent to three quarter notes).
- If 16 is the bottom number, the beat is a dotted eighth note (equivalent to three sixteenth notes).

In simple meters, the beat divides into two parts, the first accented and the second non-accented. In compound meters, the beat divides into three parts, the first accented and the second and third non-accented. The counts for compound meter are different from simple meter, as demonstrated in **Example 3**, which is in 68



Counting by openmusictheory

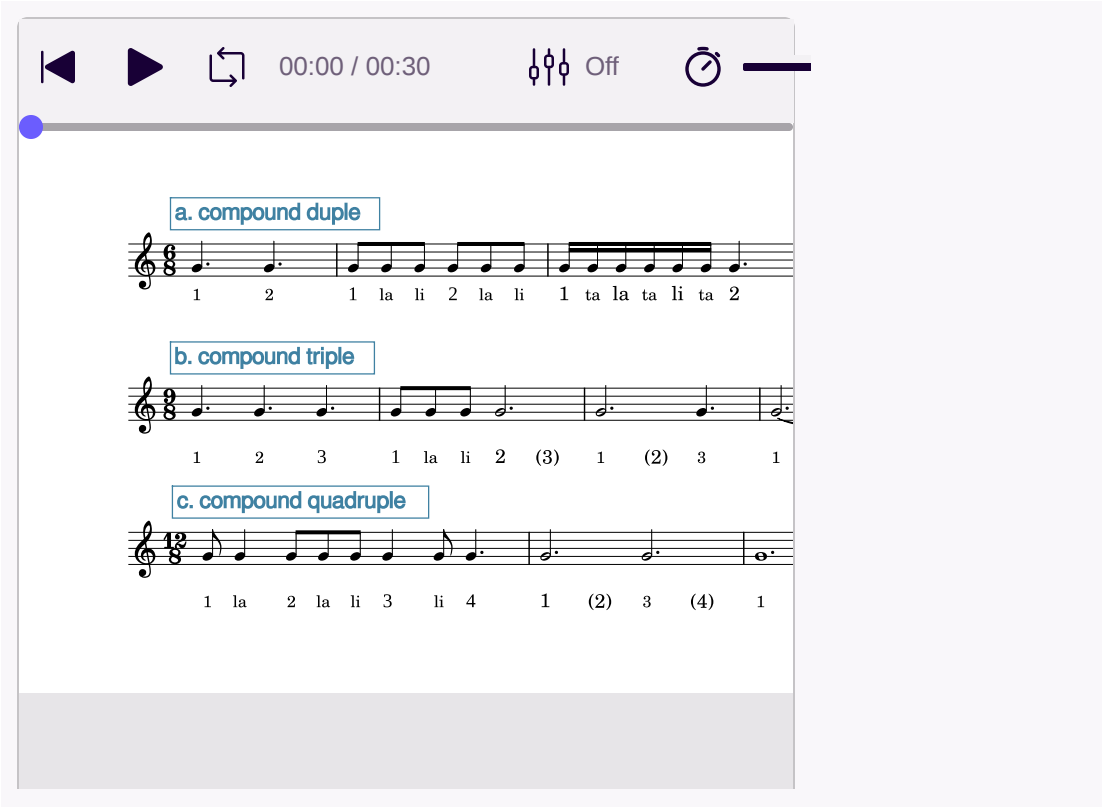
Example 3. *Counting in a compound duple meter.*

In this time signature, each measure has two beats (6÷3=2), indicating duple meter. Each dotted quarter note (the beat) gets a count, which is expressed in Arabic numerals, like in simple meter. For notes that are longer than one beat (such as the dotted half note in the fourth measure of **Example 3**), the beats that are not counted out loud are still written in parentheses. Divisions are counted using the syllables “la” (first division) and “li” (second division). As the final measure of **Example 3** shows, further subdivisions at the sixteenth-note level are counted as “ta,” with the “la” and “li” syllables on the eighth-note subdivisions remaining consistent.

The third measure of **Example 3** presents two of the most common compound-meter rhythms with divisions, so make sure to review this measure carefully if you are not familiar with compound meter.

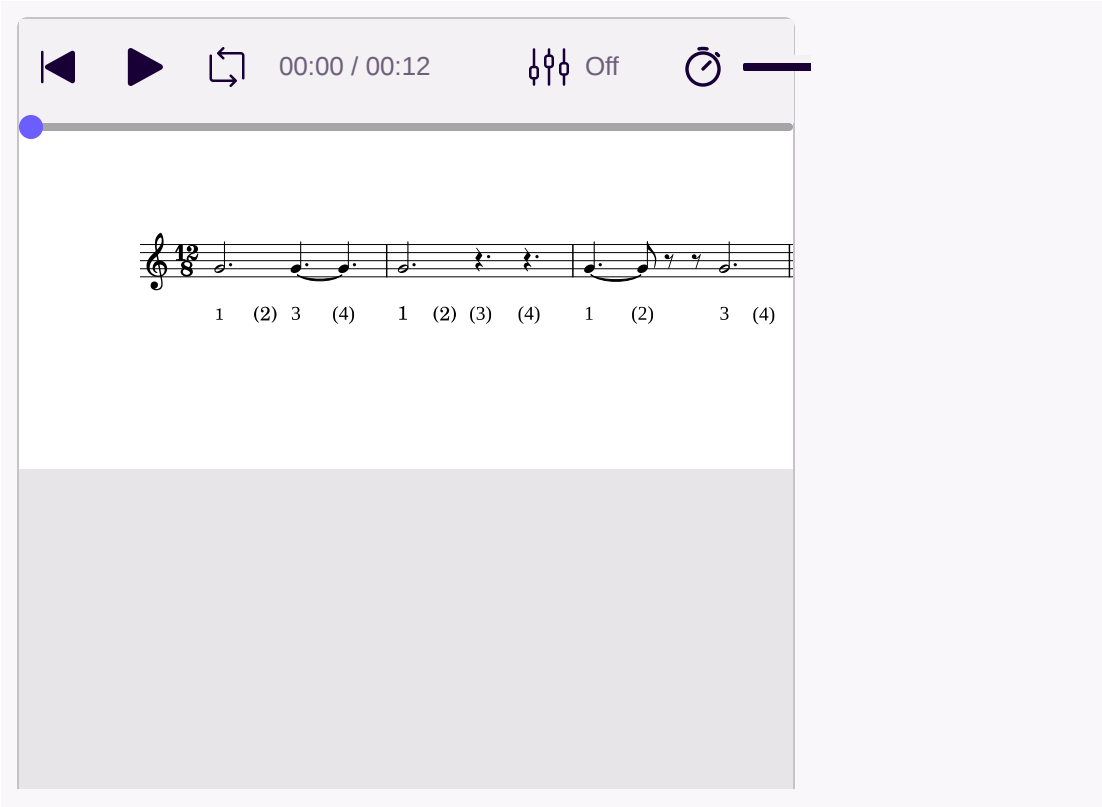
Please note that your instructor may employ a different counting system. *Open Music Theory* privileges American traditional counting, but this is not the only method.

Example 4 gives examples of rhythms in (a) duple, (b) triple, and (c) quadruple meter. Just as with simple meters, compound duple meters have only two beats, compound triple meters have three beats, and compound quadruple meters have four beats.



Example 4. *(a) Compound duple has two beats, (b) compound triple has three beats, and (c) compound quadruple has four beats.*

Like in simple meters, beats that are not articulated because of rests and ties are written in parentheses and not counted out loud, as shown in **Example 5**. However, because dotted notes receive the beat in compound meters, dotted rhythms do not cause beats to be written in parentheses the way they do in simple meters.

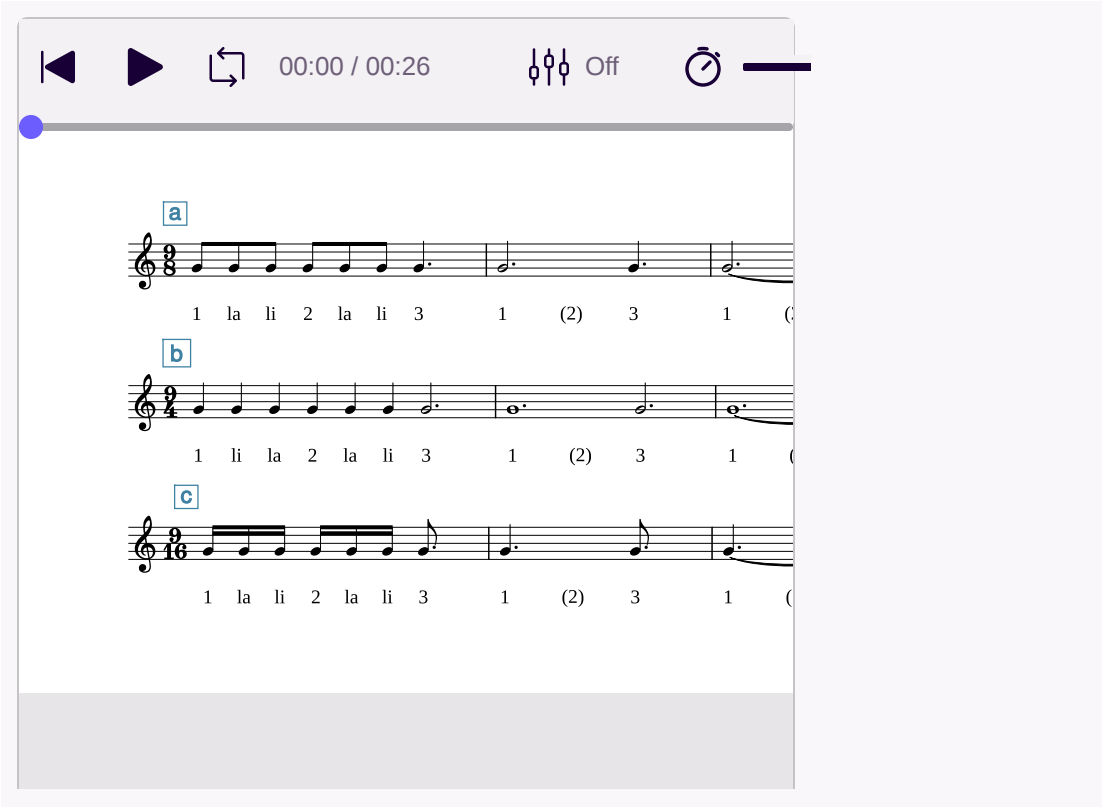


Beats That Are Not Counted Out Loud Are Put in Parentheses by openmusictheory

Example 5. *Beats that are not counted out loud are put in parentheses.*

Counting with Division Units of 4 and 16

So far, we have focused on meters with a dotted-quarter beat. In compound meters with other beat units (shown in the bottom number of the time signature), the same counting patterns are used for the beats and subdivisions, but they correspond to different note values (**Example 6**).



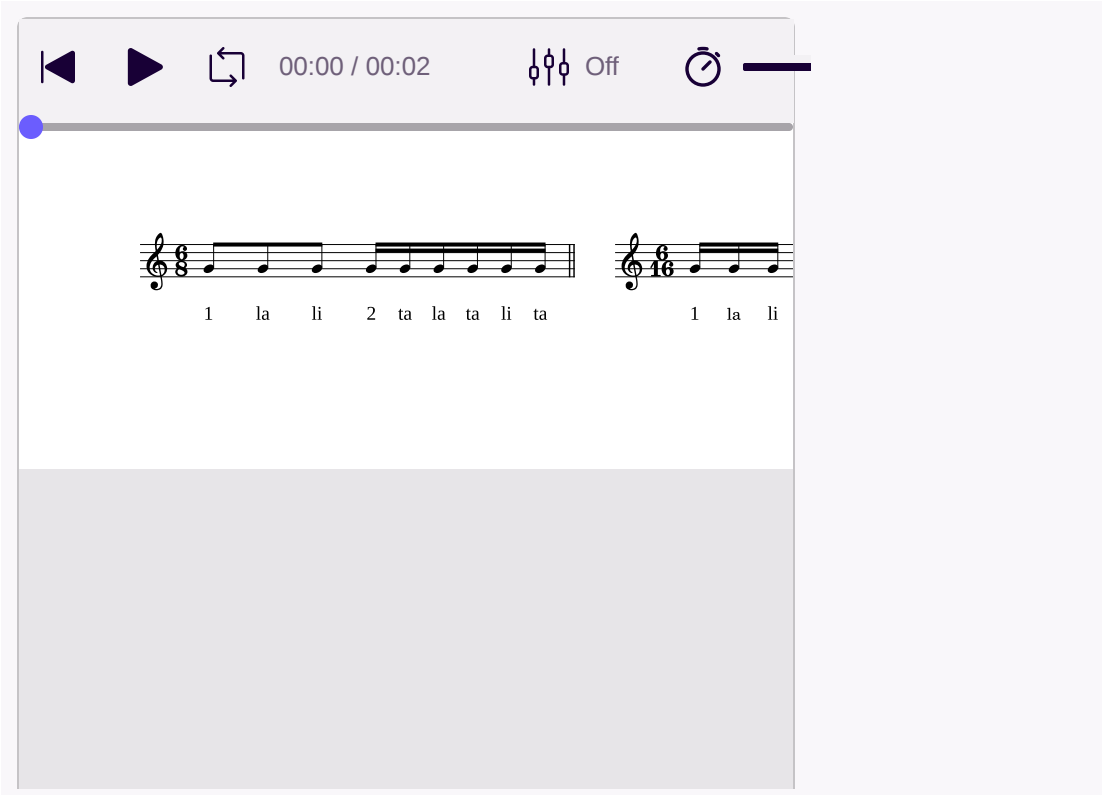
Beat Units by openmusictheory

Example 6. *The same rhythm written with three different beat units: (a) dotted quarter, (b) dotted half, and (c) dotted eighth.*

Each of these rhythms sounds the same and is counted the same. They are also all considered compound triple meters. The difference in each example is the bottom number—which note gets the division unit (eighth, quarter, or sixteenth), which then determines the beat unit.

Beaming, Stems, and Flags

In compound meters, **beams** still connect notes together by beat; beaming therefore changes in different time signatures. In the first measure of **Example 7**, sixteenth notes are grouped into sets of six, because six sixteenth notes in a 6886 time signature are equivalent to one beat. In the second measure of **Example 7**, sixteenth notes are grouped into sets of three, because three sixteenth notes in a 616166 time signature are equivalent to one beat.



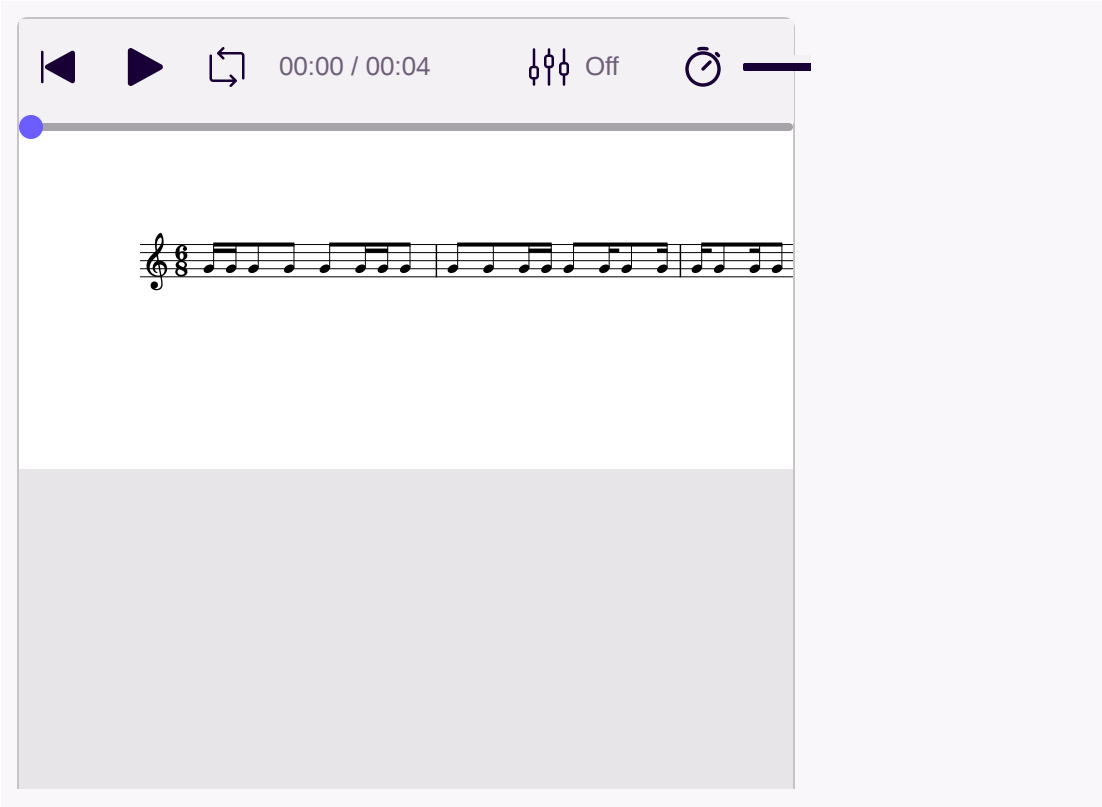
Example 7. *Beaming in two different meters.*

When the music involves note values smaller than a quarter note, you should always clarify the meter with beams, regardless of whether the time signature is simple or compound. **Example 8** shows twelve sixteenth notes beamed properly in two different meters. The first measure is in simple meter, so the notes are grouped by beat into sets of four; in the second measure, the compound meter requires the notes to be grouped by beat into sets of six.

Example 8. *Proper beaming is essential in both simple and compound meters.*

The same rules of stemming and flagging that applied in simple meter still apply in compound meter. For notes above the middle line, stems and flags point downward on the left side of the note, and for notes below the middle line, stems and flags point upward on the right side of the note. Stems and flags on notes on the middle line can point in either direction, depending on the surrounding notes.

Like in simple meters, partial beams can be used for mixed rhythmic groupings. If you aren't yet familiar with these conventions, pay special attention to how the notes in **Example 9** are beamed.



The Most Common Partially Beamed Variations With A Division Unit Of The Eighth Note by openmusictheory

Example 9. *The most common partially beamed variations with a division unit of the eighth note.*

Online Resources

- Compound Meter Tutorial (musictheory.net) (compound meter starts about halfway through)
- Video Tutorial on Compound Meters and Beats (YouTube) (start at 1:49 for compound meter)
- Compound Meter Counting and Time Signatures (John Ellinger)
- Compound Meter Counting (YouTube)
- Compound Meter Rhythmic Practice (YouTube)
- Compound Meter Beaming (Michael Sult)

Assignments from the Internet

A. Meter Identification (Simple and Compound) (.pdf,), and with Bar Lines (.pdf)
B. Meter Beaming (Simple and Compound) (.pdf), and pp. 4 and 5 (.pdf)
C. Time Signatures (Simple and Compound) (.pdf)
D. Counting in 6/8 (.pdf, .pdf, .pdf)
E. Time Signatures (.pdf, .pdf, .pdf)
F. Bar Lines (.pdf), and p. 2 (.pdf)

Assignments

1. Notes, Rests, Bar Lines (.pdf, .docx)
2. Re-beaming (.pdf, .musx)

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SECTION OVERVIEW

2.4: Other Rhythmic Essentials

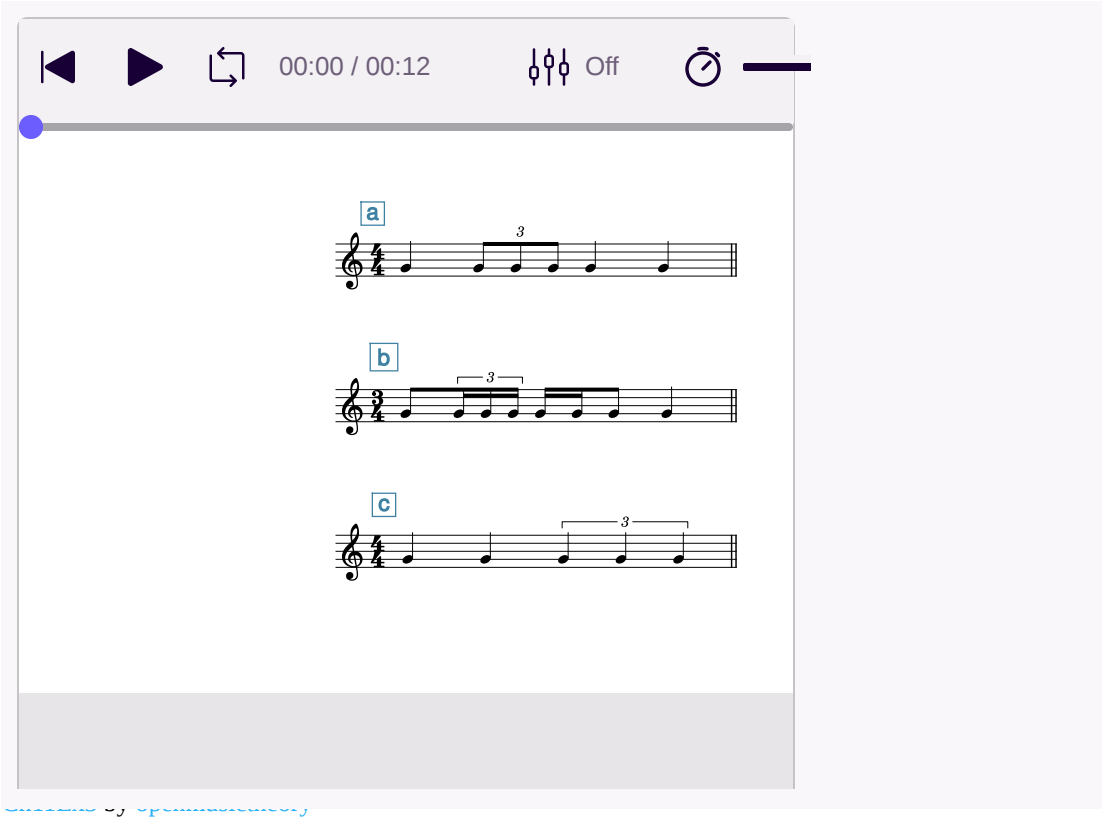
Key Takeaways

- A **triplet** is a type of **tuplet** in which a beat (or subdivision, or multiple beats) in simple meter is divided into three parts. Notate a triplet by writing a 3 above the triplet rhythm.
- A **duplet** is a tuplet in which a beat (or subdivision) in compound meter is divided into two parts. Notate a duplet by writing a 2 above the duplet rhythm.
- **Hypermeter** refers to the patterns of accentuation at the metrical level. **Hypermetrical numbers** are centered above measures to denote these patterns of accentuation.
- **Syncopation** happens when there are **off-beat** rhythmic accents, which can be created by ties, dots, rests, and/or dynamics.

Borrowed Divisions

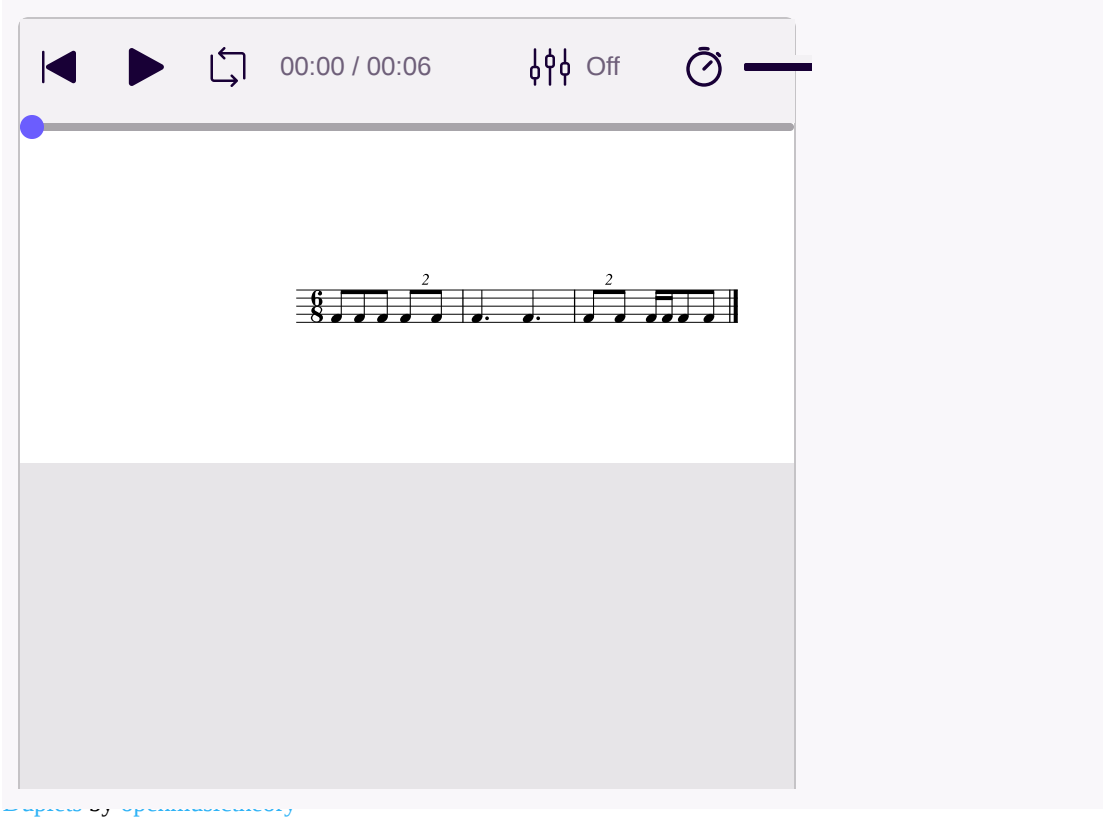
Typically, a meter is defined by the presence of a consistent beat division: division by two in simple meter, and by three in compound meter. Sometimes composers will use a triple division of the beat in a simple meter, or a duple division of the beat in a compound meter; these rhythms are called **tuplets**. **Triplets** are a type of tuplet in which a beat (or subdivision, or multiple beats) in simple meter is divided into three parts. Triplets are sometimes thought of as "borrowed" from compound meter, because the beat in compound meter is usually divided into three parts. A triplet is notated by writing the number 3 on top of the triplet rhythm**.**

Triplets may occur at both any metric level, as seen in **Example 1**. In **Example 1a**, the triplet is at the beat level—this is the most common use of a triplet. **Example 1b** shows a sixteenth-note triplet, which is equivalent to one eighth note (the division in this time signature). Triplets also may occur across multiple beats, as seen in **Example 1c**. This triplet (notated with three quarter notes) takes up the space of one half note.



Example 1. *Triplets at (a) the beat level, (b) the subdivision level, and (c) the multi-beat level.*

A **duplet** is a tuplet in which a beat (or subdivision) in compound meter is divided into two parts. Duplets are notated by writing the number 2 on top of the duplet rhythm, as seen in **Example 2**.

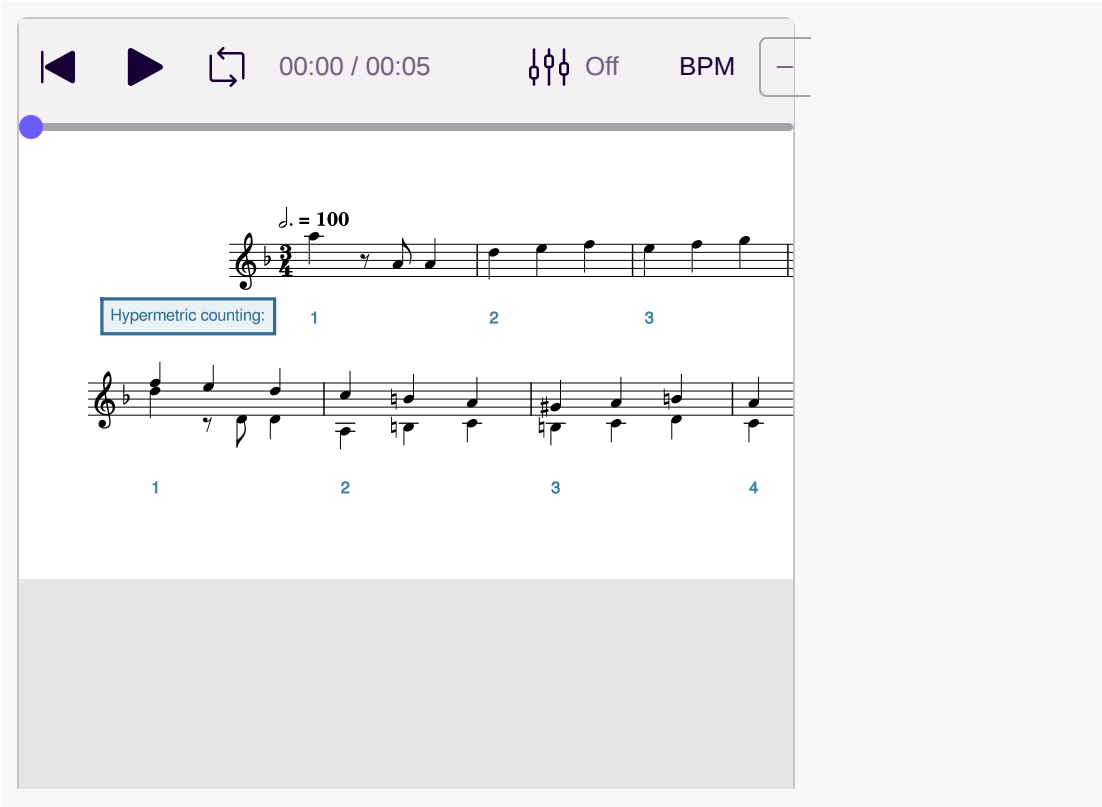


Example 2. *Notate a duplet by writing a 2 on top of the duplet rhythm.*

Counting for tuplet rhythms is usually "borrowed" as well. For example, triplets are usually counted 1-la-li, while duplets are usually counted 1-and, 2-and, etc.

Meter Beyond Measure (Hypermeter)

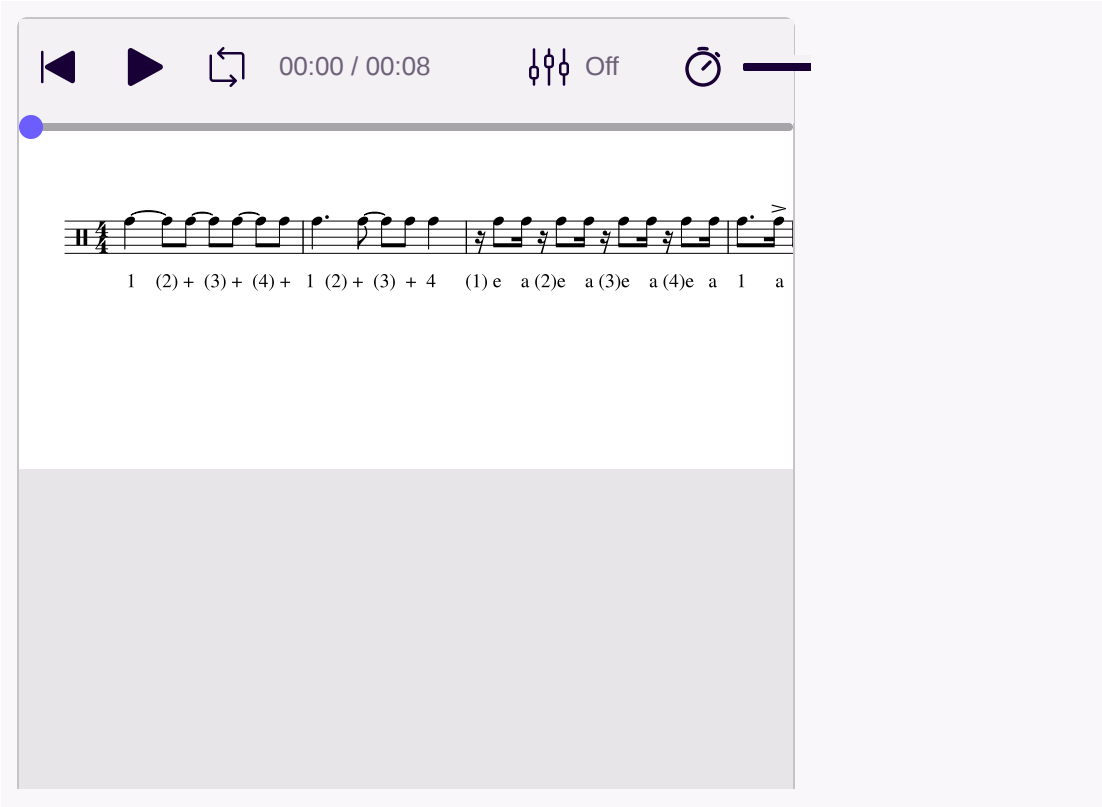
We have seen that beats are either accented or non-accented which was observed in the discussion of conducting patterns in the previous two chapters (see Simple Meter and Time Signatures and Compound Meter and Time Signatures). **Hypermeter** refers to groups of measures that form patterns of accentuation, especially at faster tempos. In order to label patterns of accentuation across multiple measures, one can place **hypermetrical numbers** above measures (centered). **Example 3** shows an example from the "Scherzo" of Ludwig van Beethoven's Symphony no. 9 (1824), played on a keyboard. While listening to **Example 3**, try conducting along to the hypermetrical numbers in a quadruple pattern. By doing this, you will be able to feel (and hear) which measures are more accented (1 and 3) and which are less accented (2 and 4).



Example 3. *Eight measures of the "Scherzo" of Ludwig van Beethoven's Symphony no. 9 (1824) with hypermetric counts.*

Syncopation

Syncopation happens when there are off-beat rhythmic accents (see Rhythm and Meter in Pop Music for more information), and as **Example 4** shows, it can be created by ties, dots, rests, and/or dynamics. In measure 1, the ties create the syncopation, while in measure 2, the rhythm is syncopated because of both a dot and a tie. The sense of syncopation in measure 3 is created by the rests at the beginning of each beat. In measure 4, while there is an eighth note on each division, the off-beat accents (dynamics) produce syncopation.



Different Examples of Syncopated rhythms by openmusictheory

Example 4. *Different examples of syncopated rhythms.*

Online Resources

- Triplets and Duplets (YouTube)
- Triplets (Hello Music Theory)
- Duplets (Hello Music Theory)
- Syncopation (Music Theory Academy)
- Syncopated Rhythm Practice (YouTube)

Assignments from the Internet

A. Counting Triplets, pp. 32–33 (.pdf)
B. Counting Duplets, p. 13 (.pdf)
C. Hypermetrical Numbers (.pdf)
D. Counting Syncopation (.pdf, website, .pdf)

Assignments

Triplets and Duplets, Hypermeter, Syncopation (.pdf, .docx)

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CHAPTER OVERVIEW

3: Unit 3- Scales

3.1: Major Scales, Scale Degrees, and Key Signatures
3.2: Minor Scales, Scale Degrees, and Key Signatures
3.3: Introduction to Diatonic Modes and the Chromatic “Scale”

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SECTION OVERVIEW

3.1: Major Scales, Scale Degrees, and Key Signatures

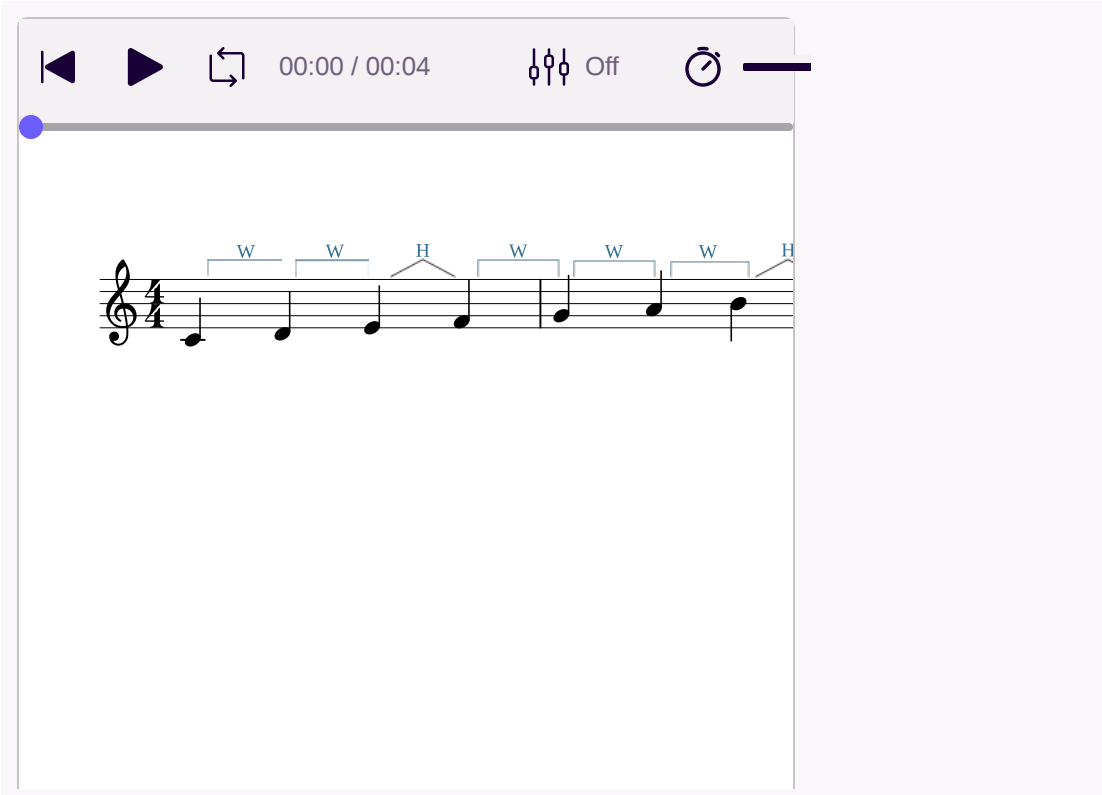
Key Takeaways

- A major **scale** is an ordered collection of half and whole steps with the ascending succession W-W-H-W-W-W-H.
- Major scales are named for their first note (which is also their last note), including any accidental that applies to the note.
- **Scale degrees** are **solmization** syllables notated by **Arabic numerals** with **carets** above them. The scale degrees are ^1−^2−^3−^4−^5−^6−^71^−2^−3^−4^−5^−6^−7^.
- **Solfège solmization** syllables are another method of naming notes in a major scale. The syllables are *do*, *re*, *mi*, *fa*, *sol*, *la*, and *ti*.
- Each note of a major scale is also named with **scale-degree names**: tonic, supertonic, mediant, subdominant, dominant, submediant, and leading tone.
- A **key signature**, consisting of either **sharps** or **flats**, appears at the beginning of a composition, after a clef but before a time signature.
- The order of sharps in key signatures is F, C, G, D, A, E, B, while the order of flats is the opposite: B, E, A, D, G, C, F. In sharp key signatures, the last sharp is a half step below the tonic (the first note of a scale). In flat key signatures, the second-to-last flat is the tonic.
- The **circle of fifths** is a convenient visual for remembering major key signatures. All of the major key signatures are placed on a circle in order of number of accidentals.

A **scale** is an ordered collection of half and whole steps (see Half and Whole Steps and Accidentals to review).

Major Scales

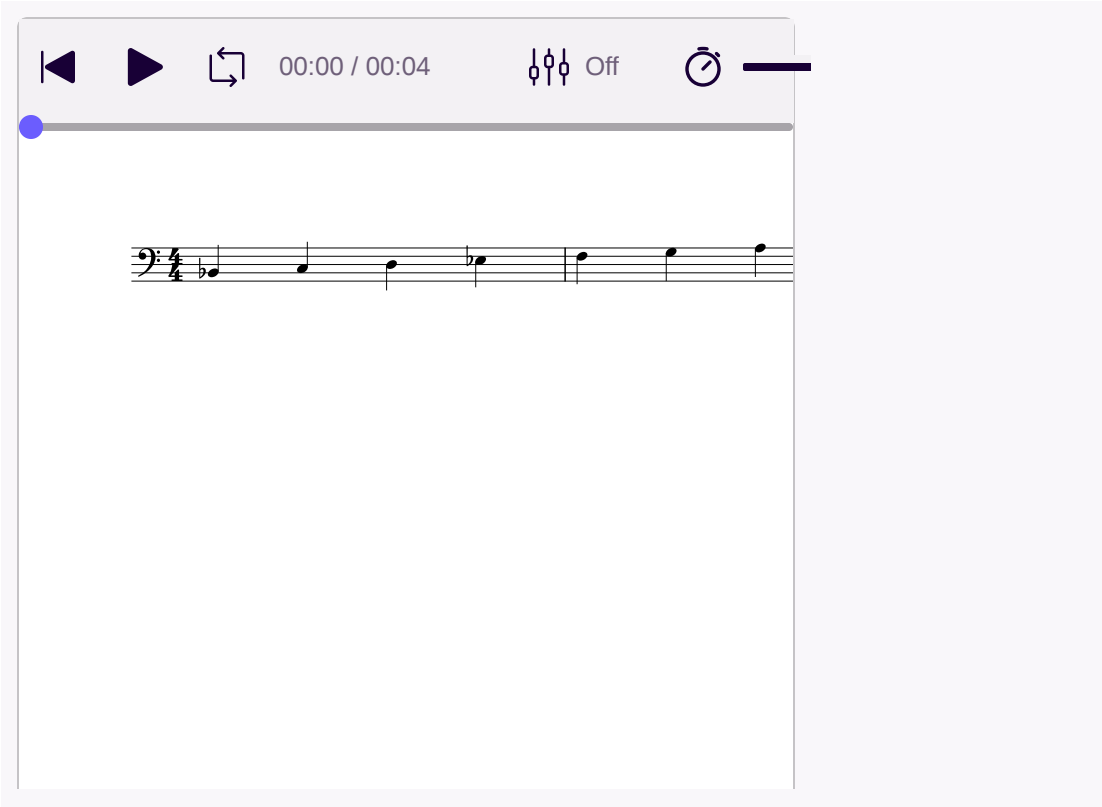
A **major scale** is an ordered collection of half- (abbreviated H) and whole steps (abbreviated W) in the following ascending succession: W-W-H-W-W-W-H. Listen to **Example 1** to hear an ascending major scale. Each whole step is labeled with a square bracket and “W,” and each half step is labeled with an angled bracket and “H.”



Example 1. *An ascending major scale.*

A major scale always starts and ends on notes of the same letter name, one **octave** apart, and this starting and ending note determines the name of the scale. Therefore, **Example 1** depicts a C major scale because its first and last note is a C.

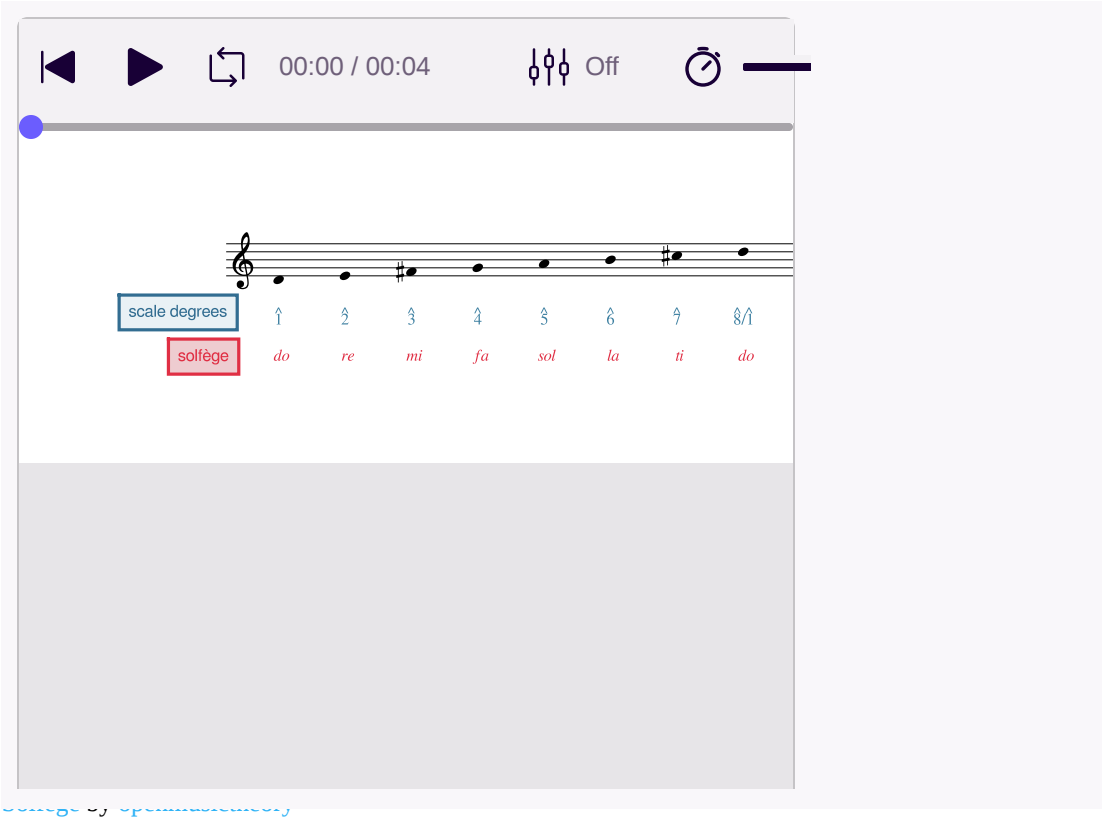
The name of a scale includes any accidental that applies to the first and last note. **Example 2** shows a B♭ (B-flat) major scale—not a B major scale, which would use a different collection of pitches. Note that the pattern of half and whole steps is the same in every major scale, as shown in **Example 1** and **Example 2**.



Example 2. *A B-flat major scale.*

Scale Degrees, Solfège, and Scale-Degree Names

Musicians name the notes of major scales in several different ways. **Scale degrees** are **solmization** syllables notated by **Arabic numerals** with **carets** above them. The first note of a scale is ^11^ and the numbers ascend until the last note of a scale, which is also ^11^ (although some instructors prefer ^88^). **Example 3** shows a D major scale with each scale degree labeled with an Arabic numeral and a caret.



Example 3. *A D major scale.*

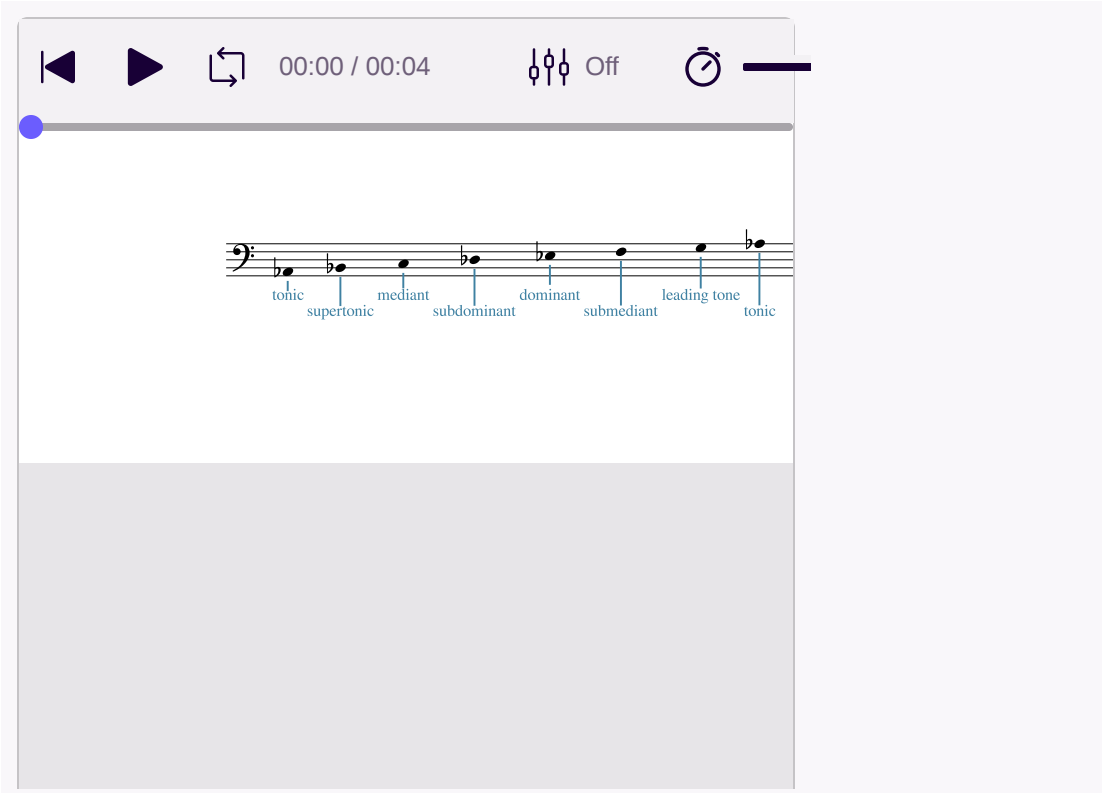
Below the scale degrees, Example 3 also shows another method of naming notes in a major scale: solfège solmization syllables. **Solfège** (a system of **solmization** syllables) are another method of naming notes in a major scale. The syllables *do*, *re*, *mi*, *fa*, *sol*, *la*, and *ti* can be applied to the first seven notes of any major scale; these are analogous to the scale degrees ^11^, ^22^, ^33^, ^44^, ^55^, ^66^, and ^77^. The last note is *do* (^11^) because it is a repetition of the first note. Because *do* (^11^) changes depending on what the first note of a major scale is, this method of solfège is called **movable *do*.** This is in contrast to a **fixed *do*** solmization system, in which *do* (^11^) is always the pitch class C.

Each note of a major scale is also named with **scale-degree names**: tonic, supertonic, mediant, subdominant, dominant, submediant, leading tone, and then tonic again. **Example 4** shows how these names align with the scale-degree number and solfège systems described above.

Scale Degree Number	Solfège	Scale Degree Name
^11^	*do*	Tonic
^22^	*re*	Supertonic
^33^	*mi*	Mediant
^44^	*fa*	Subdominant
^55^	*sol*	Dominant
^66^	*la*	Submediant
^77^	*ti*	Leading Tone
^88^ / ^11^	*do*	Tonic

Example 4. *Scale-degree numbers, solfège syllables, and scale-degree names.*

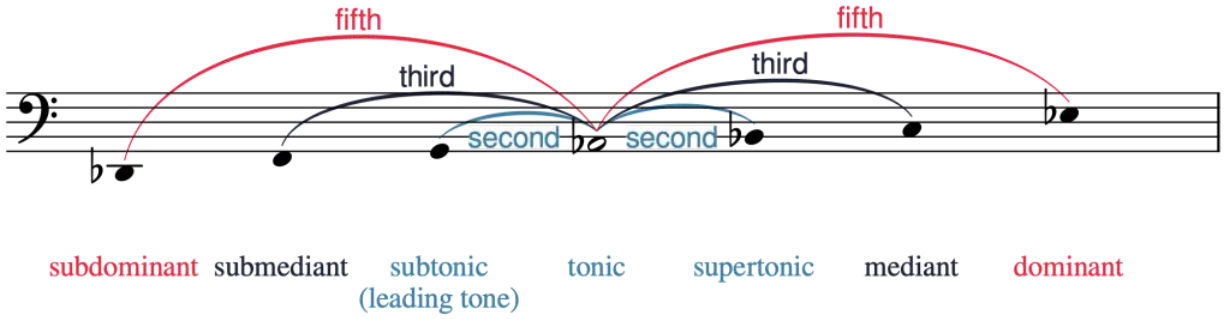
Example 5 shows these scale-degree names applied to an A♭ major scale:



Example 5. *An A♭ major scale with scale-degree names.*

Example 6 shows the notes and scale-degree names of the A♭ major scale in an order that shows how the names of the scale degrees were derived. The curved lines above the staff show the intervallic distance between each scale degree and the tonic.

- The word *dominant* is inherited from medieval music theory, and refers to the importance of the fifth above the tonic in **diatonic** music.
- The word *mediant* means "middle," and refers to the fact that the mediant is in the middle of the tonic and dominant pitches.
- The Latin prefix *super* means "above," so the supertonic is a second above the tonic. This is the only "super-" interval.
- The Latin prefix *sub* means "below"; the subtonic, submediant, and subdominant are the inverted versions (i.e., below the tonic) of the supertonic, mediant, and dominant respectively. (Note that in this text, we prefer the term **leading tone** instead of "subtonic" when referring to the scale-degree that is a half step below tonic, so named because it is often thought of as "leading" toward the tonic.)

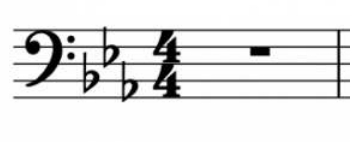


Example 6. *The notes of the A♭ major scale arranged to show the derivation of scale-degree names.*

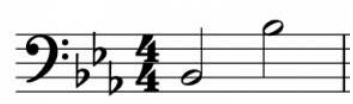
Key Signatures

A **key signature**, consisting of either **sharps** or **flats**, appears at the beginning of a composition, after a clef but before a time signature. You can remember this order because it is alphabetical: clef, key, time. **Example 7** shows a key signature in between a

bass clef and a time signature.



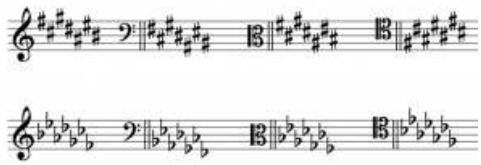
Example 7. *A key signature goes after a clef, but before a time signature.*



Example 8. *Both Bs are flat, regardless of octave.*

Key signatures collect the accidentals in a scale and place them at the beginning of a composition so that it is easier to keep track of which notes have accidentals applied to them. In **Example 7**, there are flats on the lines and spaces that indicate the notes B, E, and A (reading left to right). Therefore, every B, E, and A in a composition with this key signature will be flat, regardless of octave. In **Example 8** both of these Bs will be flat because B♭ is in the key signature.

Flat key signatures have a specific order in which flats are added, and the same is true of the sharps in sharp key signatures. These orders apply regardless of clef. **Example 9** shows the order of sharps and flats in all four clefs that we have learned:

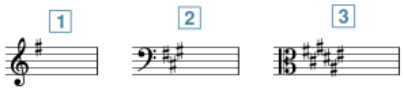


Example 9. *The order of sharps and flats in treble, bass, alto, and tenor clefs.*

The order of sharps is always F, C, G, D, A, E, B. This can be remembered with the mnemonic "Fat Cats Go Down Alleys (to) Eat Birds." The sharps form a zig-zag pattern, alternating going down and up. In the treble, bass, and alto clefs, this pattern "breaks" after D♯ and then resumes. In the tenor clef, there is no break, but F♯ and G♯ appear in the lower octave instead of the upper octave.

The order of the flats is the opposite of the order of the sharps: B, E, A, D, G, C, F. This makes the order of flats and sharps palindromes. The order of flats can be remembered with this mnemonic: "Birds Eat And Dive Going Copiously Far." The flats always make a perfect zig-zag pattern, alternating going up and down, regardless of clef, as seen in **Example 9**.

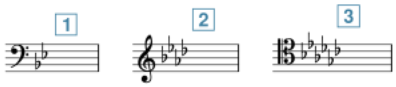
There are easy ways to remember which key signature belongs to which major scale. In sharp key signatures, the last sharp is a half step below the tonic (the first note of a scale). **Example 10** shows three sharp key signatures in different clefs. Here's how to identify each with this method:



Example 10. *Three different sharp key signatures in treble, bass, and alto clefs.*

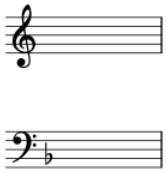
1. The last sharp (in this case the only sharp), F♯, is a half step below the note G. Therefore, this is the key signature of G major.
2. The last sharp, G♯, is a half step below the note A. Therefore, this is the key signature of A major.
3. The last sharp, E♯, is a half step below the note F♯. Therefore, this is the key signature of F♯ major.

In flat key signatures, the second-to-last flat is the tonic (the first note of a scale). **Example 11** shows three flat key signatures in different clefs. Here's how to identify each with this method:



Example 11. *Three different flat key signatures in bass, treble, and tenor clefs.*

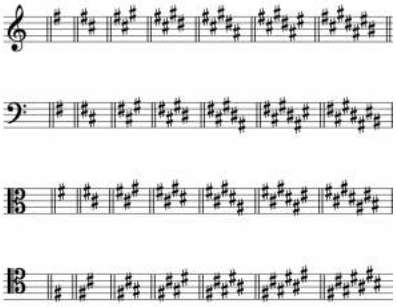
1. The second-to-last flat in this key signature is B♭. Therefore, this is the key signature of B♭ major.
2. The second-to-last flat is A♭. Therefore, this is the key signature of A♭ major.
3. The second-to-last flat is G♭. Therefore, this is the key signature of G♭ major.



Example 12. *The key signatures of C major (top) and F major (bottom).*

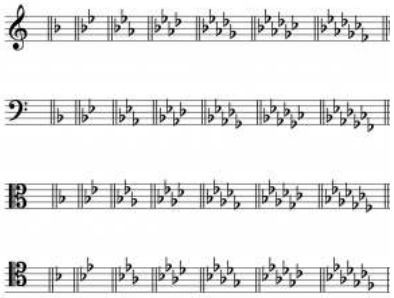
There are two key signatures that have no "tricks" that you will simply have to memorize. These are C major, which has nothing in its key signature (no sharps or flats), and F major, which has one flat: B♭ (**Example 12**).

Example 13 shows the key signature for C major (no sharps or flats) followed by all of the sharp key signatures in order in all four clefs: G, D, A, E, B, F♯, and C♯ major.



Example 13. *The key signatures of C, G, D, A, E, B, F♯, and C♯ in all four clefs.*

Example 14 first shows the key signature for C major (no sharps or flats), then all of the flat key signatures in order in all four clefs: F, B♭, E♭, A♭, D♭, G♭, and C♭ major.

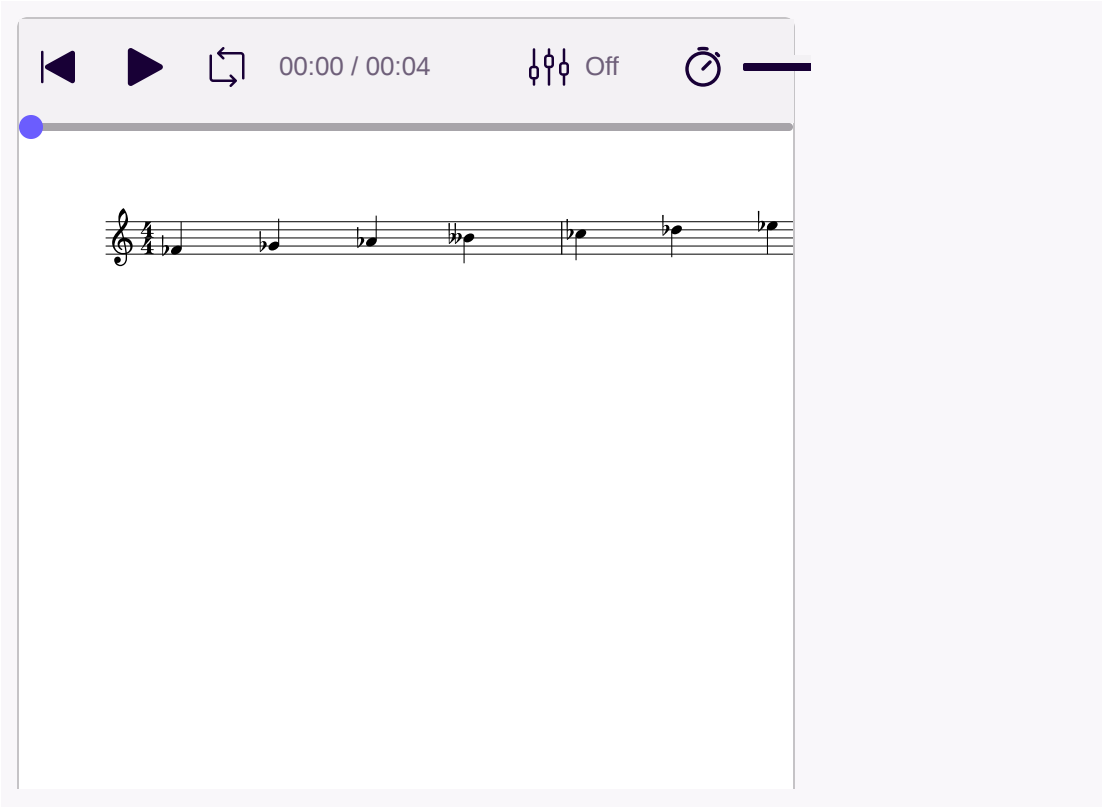


Example 14. *The key signatures of C, F, B♭, E♭, A♭, D♭, G♭, and C♭ in all four clefs.*

Example 14 first shows the key signature of C major (with no sharps or flats), and then the key signatures of F, B♭, E♭, A♭, D♭, G♭, and C♭ in all four clefs.

There is one other "trick" that might make memorization of the key signatures easier: C major is the key signature with no sharps or flats, C♭ major is the key signature with every note flat (7 flats total), and C♯ major is the key signature with every note sharp (7 sharps total).

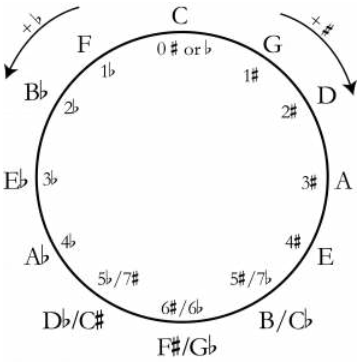
Major keys are said to be "real" if they correspond to one of the key signatures in **Examples 13** or **14**. If a **double sharp** or **double flat** would be needed for a key signature, then that key signature would be "imaginary." Occasionally, you may encounter music in an imaginary key. **Example 15** shows an F♭ major scale; an F♭ major key signature is imaginary because it would need a B𝄫.



Example 15. An F♭ major scale in treble clef.

The Circle of Fifths

The **circle of fifths** is a convenient visual. In the circle of fifths, all of the major key signatures are placed on a circle in order of number of accidentals. The circle of fifths is so named because each key signature is a fifth away from the ones on either side of it. **Example 16** shows the circle of fifths for major key signatures:



Example 16. The circle of fifths for major keys.

If you start at the top of the circle (12 o'clock), the key signature of C major appears, which has no sharps or flats. If you continue clockwise, sharp key signatures appear, each subsequent key signature adding one more sharp. If you continue counter-clockwise from C major, flat key signatures appear, each subsequent key signature adding one more flat. The bottom three key signatures (at 7, 6, and 5 o'clock) in **Example 16** are **enharmonically equivalent**. For example, the B major and C♭ major scales have different key signatures—five sharps and seven flats, respectively—but they sound the same because the notes B and C♭ are enharmonically equivalent.

Online Resources

- Major Scales Tutorial (musictheory.net)

- Major Scales (Practical Chords and Harmonies)
- Major Scales (YouTube)
- Scale Degree Names (musictheoryfundamentals.com)
- Scale Degree Names (musictheory.net)
- Solfège History and Tutorial (Earlham College)
- Scale Degrees, Solfège, and Scale-degree Names (YouTube)
- Major Key Signatures (musictheory.net)
- Sharp Key Signatures (YouTube)
- Flat Key Signatures (YouTube)
- Major Key Signature Flashcards (music-theory-practice.com)
- The Circle of Fifths (YouTube)
- The Circle of Fifths (Classic FM)

Assignments from the Internet

A. Writing Major Scales (.pdf), from Tonic and Other Scale Degrees (.pdf)
B. Writing Major Key Signatures (.pdf)
C. Identifying Major Key Signatures (.pdf)
D. Major Keys Worksheets for Children (.pdf)
E. Scale Degrees or Solfège (.pdf, .pdf)

Assignments

1. Writing Major Scales (.pdf, .mscx)
2. Key Signatures: Major (.pdf, .mscx)

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SECTION OVERVIEW

3.2: Minor Scales, Scale Degrees, and Key Signatures

Key Takeaways

- A minor **scale's** third note is always a half step lower than the third note of the major scale with the same name.
- There are three variations on the minor scale: **natural minor**, **harmonic minor**, and **melodic minor**.
- Each minor scale is an ordered collection of half and whole steps, as follows:
  - Natural minor: W-H-W-W-H-W-W (ascending)
  - Harmonic minor: W-H-W-W-H-3Hs-H (ascending)
  - Melodic minor: W-H-W-W-W-W-H (ascending) and W-W-H-W-W-H-W (descending).
- While there are three minor scales, minor keys and minor key signatures are always identified as simply "minor" ("A minor," "D minor," etc.) and are based on the natural minor scale.
- **Scale degrees** in minor are the same as those in major. There are a few new **solfège** syllables in minor including *me* (↓^3↓3^), *le* (↓^6↓6^), and *te* (↓^7↓7^).
- Each note of a minor scale is also named with **scale-degree names**. These are largely the same in minor as they are in major, except for the subtonic (*te* or ↓^7↓7^).
- Major and minor keys share two different relationships. The **parallel relationship** is when a major and minor key share a tonic note, while the **relative relationship** is when a major and minor key share a key signature.
- Each major **key signature** has a corresponding relative minor key signature whose tonic is three half steps below the relative major's tonic. The orders of sharps and flats in major and minor key signatures are the same.

CHAPTER PLAYLIST

The Minor Scale

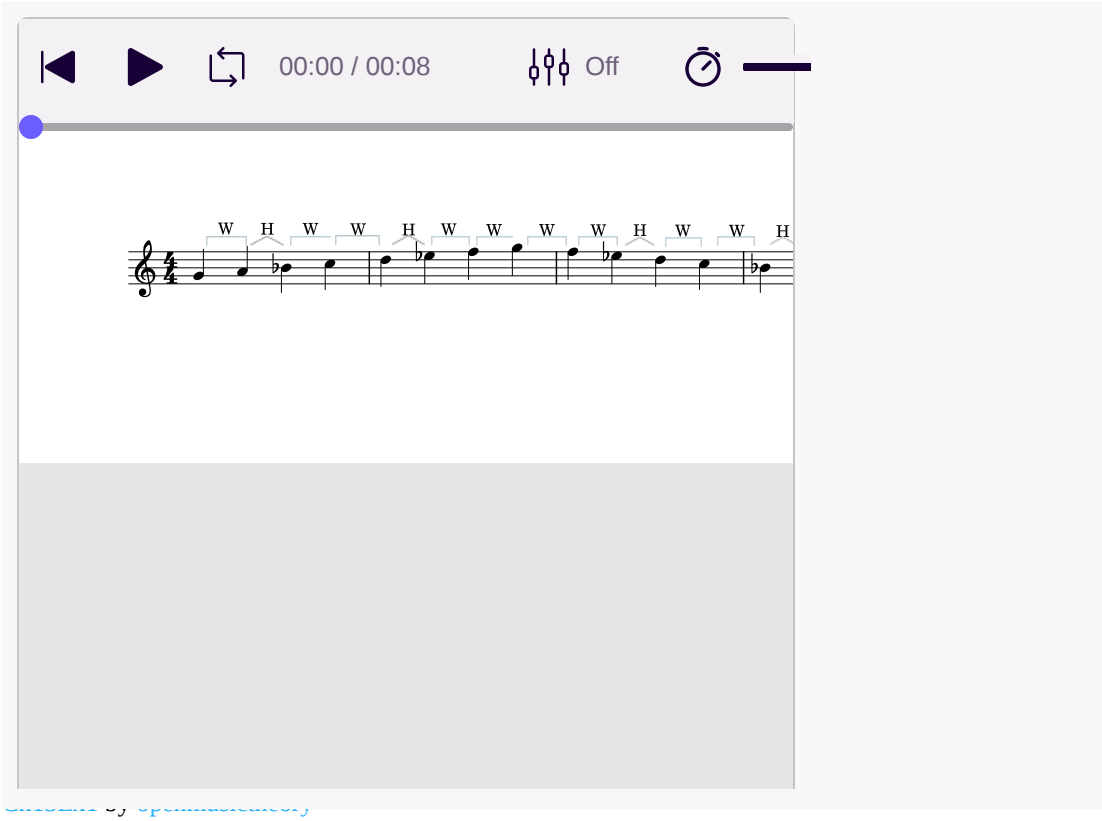
A minor **scale's** third note is always a half step lower than the third note of the major scale with the same name (e.g., B major and B minor). Many musicians familiar with Western classical music hear minor works as sounding more "sad" than major works, which they often hear as "happier."[1]

There are three different types of minor scales: **natural minor**, **harmonic minor**, and **melodic minor**. These three types of minor scales should be thought of like flavors of ice cream; ice cream is still ice cream regardless of whether it is chocolate, vanilla, strawberry, etc. Likewise, a work is simply "minor" or "in minor"; musicians do not consider music to be "in" a specific type of minor scale (i.e., natural, harmonic, or melodic). In other words, while there are three minor scales, minor keys and minor key signatures are always identified as simply "minor" ("A minor," "D minor," etc.) and are based on the natural minor scale.

The three different types of minor scales are useful categories primarily for instrumental performers. Learning to play the different types of minor scales on instruments allows performers to become familiar with the minor patterns most commonly used in Western classical music. Just like major scales, minor scales are named for their first note (including the accidental, if any), which is also their last note.

Natural Minor

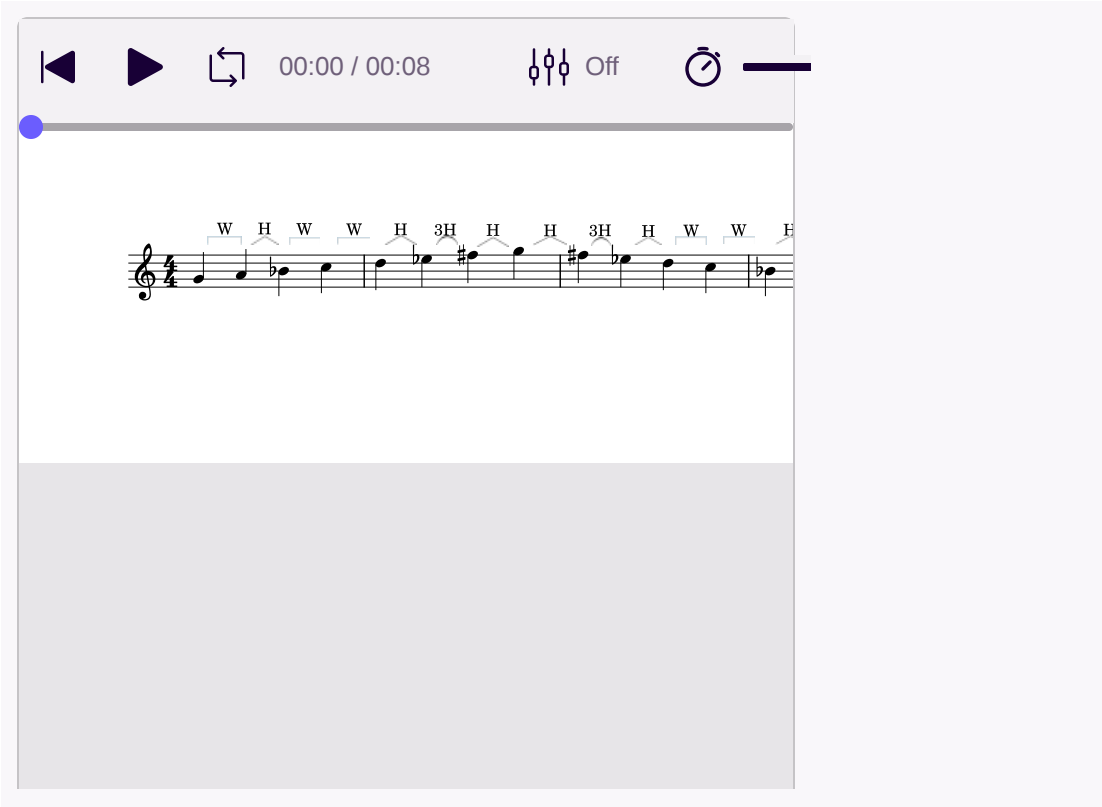
The natural minor form of the minor scale consists of an ordered collection of half and whole steps with the ascending succession W-H-W-W-H-W-W, as shown in **Example 1**. Each whole step is labeled with a square bracket and "W," and each half step is labeled with an angled bracket and "H." Listen carefully to **Example 1** and notice that the half and whole step pattern of the natural minor form of the minor scale is the same ascending and descending.



Example 1. A G natural minor scale.

Harmonic Minor

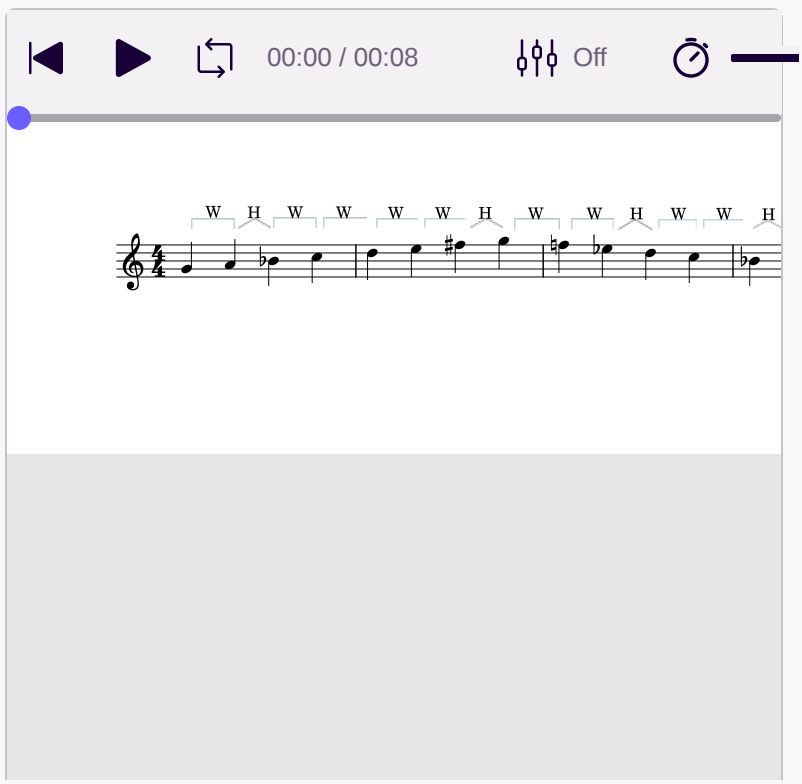
The harmonic minor form of the minor scale consists of an ordered collection of half and whole steps in the ascending succession W-H-W-W-H-3Hs-H ("3Hs" = 3 half steps), as shown in **Example 2**. The curved bracket represents a distance of three half steps (or a whole step plus a half step). Listen carefully to **Example 2** and notice that the half and whole step pattern of the harmonic minor form of the minor scale is the same ascending and descending.



Example 2. *A G harmonic minor scale.*

Melodic Minor

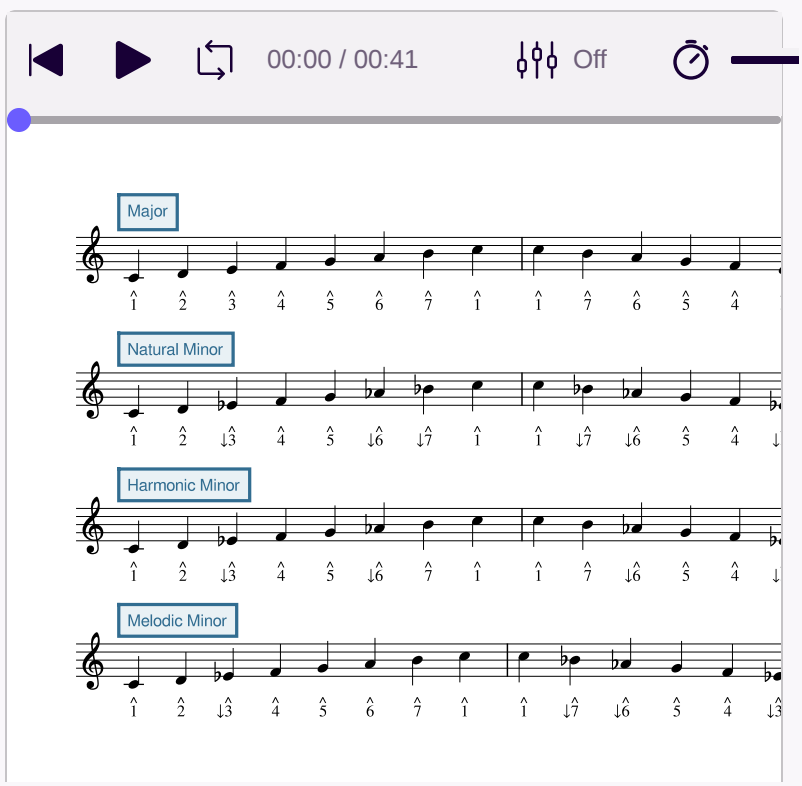
The melodic minor form of the minor scale consists of an ordered collection of half and whole steps in the ascending succession W-H-W-W-W-W-H and the descending succession W-W-H-W-W-H-W, as shown in **Example 3**. When you listen to **Example 3**, notice that the melodic minor form has different ascending and descending patterns: the ascending pattern is unique to the melodic minor form, while the descending pattern is the same as the natural form.



Melodic Minor by openmusicalcoly

Example 3. *A G melodic minor scale.*

Example 4 shows four versions of a C scale—**major**, **natural minor**, **harmonic minor**, and melodic minor—with the scale degrees indicated (see below). Listen to this example carefully, noting the aural differences between the scales.

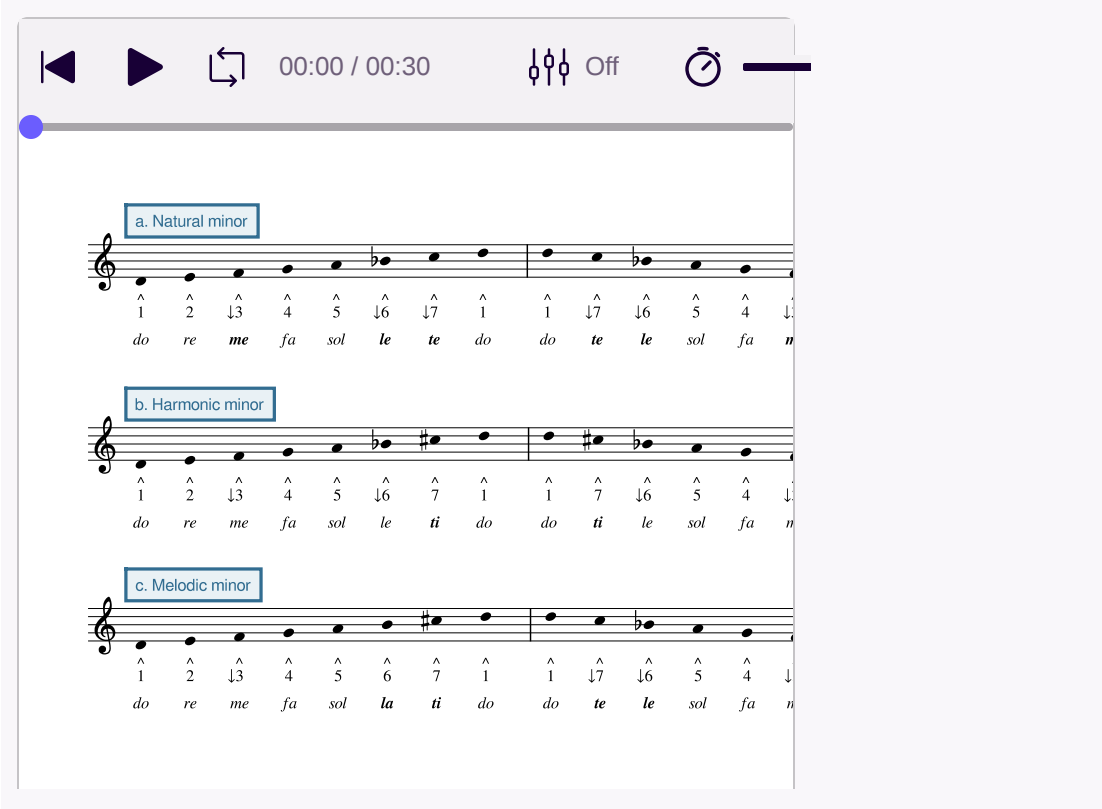


GHSLA by openmusicalcoly

Example 4. *Major, natural minor, harmonic minor, and melodic minor scales, all starting on C.*

Minor Scale Degrees, Solfège, and Scale-Degree Names

Minor **scale degrees**, **solfège**, and **scale-degree names** are similar to, but not exactly the same as, their major-scale counterparts. **Example 5** summarizes the three types of minor scale, and shows the scale degrees and solfège for each. Note that the scale degrees are the same as in a major scale. The bottom line shows the solfège syllables, which differ from the major-scale syllables in several places to reflect the minor scale's pattern of whole and half steps.



Example 5. *Scale degrees and solfege for all three types of minor scales: a) natural minor; b) harmonic minor, and c) melodic minor.*

In natural minor (**Example 5a**), *mi* (^33^) becomes *me* (↓^3↓3^) (pronounced "may"), *la* (^66^) becomes *le* (↓^6↓6^) (pronounced "lay"), and *ti* (^77^) becomes *te* (↓^7↓7^) (pronounced "tay"). If you sing or play through the above example, you'll notice that the ending lacks the same sense of closure you heard in the major scale. In the major scale, this closure is created in part by the ascending semitone between *ti* (^77^) and *do* (^11^).

In harmonic minor (**Example 5b**), *mi* (^33^) becomes *me* (↓^3↓3^) and *la* (^66^) becomes *le* (↓^6↓6^). Having *ti* (^77^) creates the sense of closure that is absent in the natural minor scale.

As noted above, the melodic minor scale has different ascending and descending patterns (**Example 5c**). In the ascending form of melodic minor, *mi* (^33^) becomes *me* (↓^3↓3^), but the rest of the solfège syllables are the same as in major. In the descending form of melodic minor, *mi* (^33^) becomes *me* (↓^3↓3^), *la* (^66^) becomes *le* (↓^6↓6^), and *ti* (^77^) becomes *te* (↓^7↓7^), like natural minor. Therefore, the ascending version of melodic minor has the sense of closure associated with the major scale, while the descending version follows the pattern of the natural minor scale.

As in major scales, each note of a minor scale is also named with **scale-degree names**. **Example 6** shows the scale-degree names used in minor scales alongside the corresponding scale-degree numbers and solfège syllables.

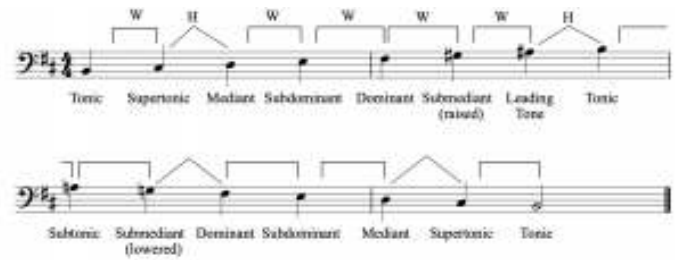
Scale Degree Number	Solfège	Scale Degree Names
^11^	*do*	Tonic

Scale Degree Number	Solfège	Scale Degree Names
^22^	*re*	Supertonic
↓^3↓3^	*me*	Mediant
^44^	*fa*	Subdominant
^55^	*sol*	Dominant
↓^6↓6^	*le*	Submediant
↓^7↓7^	*te*	Subtonic
^77^	*ti*	Leading Tone

Example 6. *Scale-degree names in minor scales.*

As the chapter on major scales discussed, the Latin prefix *sub* means "under"—the submediant is a third below the tonic, and the subdominant is a fifth below. To this, we can now add one new scale degree name: the subtonic, for lowered ↓^7↓7^. The supertonic is one whole step below the tonic, while the subtonic is one whole step below the tonic.

Example 7 shows a B melodic minor scale, ascending and descending, with scale-degree names labeled. As you can see, the melodic minor scale utilizes the leading tone in its ascending form, and the subtonic in its descending form.



Example 7. *A B melodic minor scale.*

Example 8 is a helpful visual for learning about the three forms of the minor scale. The order reflects the number of lowered scale degrees (compared to a major scale starting on the same note).

Form of Minor Scale	Lowered Scale Degrees
Natural	↓^3,↓^6,↓^7↓3^,↓6^,↓7^
Harmonic	↓^3,↓^6↓3^,↓6^
Melodic (ascending)	↓^3↓3^

Example 8. *Lowered scale degrees of minor.*

As you can see, natural minor scales have three lowered scale degrees, harmonic minor scales have two, and melodic minor scales have one in the ascending version. Remember, the descending version of melodic minor is the same as natural minor, with three lowered scale degrees.

The Parallel and Relative Relationships

When comparing major and minor keys, there are two relationships that are important. The **parallel relationship** is when a major key shares a tonic *(do*, ^11^) with a minor key. For example, C major and C minor (or A♭ major and A♭ minor, or F♯ major and F♯ minor) are parallel keys. We use the terms **parallel minor** and **parallel major** to describe this relationship: C major is the parallel major of C minor, and C minor is the parallel minor of C major.

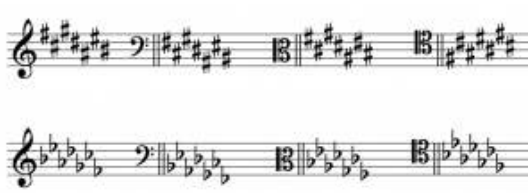
The **relative relationship** is when a major key shares a key signature with a minor key. For example, C major does not have any sharps or flats in its key signature, and neither does A minor. We use the terms **relative minor** and **relative major** to describe this relationship: C major is the relative major of A minor, and A minor is the relative minor of C major. The tonic of a minor key is

always three half steps below the tonic of its relative major: if you count three half steps below C, you will get A (C–B, B–B♭, B♭–A). Likewise, to find the relative major key of a given minor key, count three half steps up.

When counting half steps to determine the relative major or minor of a given key, keep in mind that relative keys have the same key signature. A sharp key cannot share a relative relationship with a flat key (and vice versa), which means you need to select the correct **enharmonic** key. For example, although the pitch three half steps down from D♭ could be written as either B♭ or A♯, only B♭ minor (five flats) is the relative minor of D♭ major (also five flats), because A♯ minor has a different key signature (seven sharps).

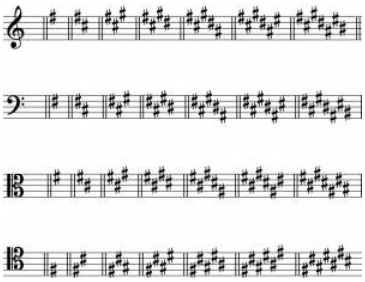
Minor Key Signatures

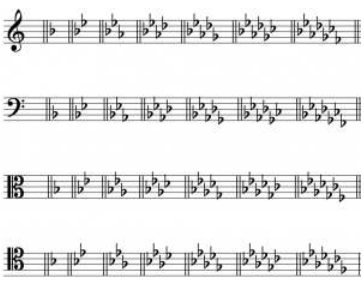
Minor **key signatures**, like major key signatures, go after a clef but before a time signature. Each major key has a corresponding relative minor key signature; therefore, the orders of the sharps and flats are the same in minor key signatures as they are in major key signatures, placed on the same lines and spaces. **Example 9**, reproduced from the previous chapter, shows the order of sharps and flats in all four clefs:



Example 9. *The order of sharps and flats in all four clefs.*

As previously mentioned, if you know the major key associated with a given key signature, you can go down three half steps from the tonic to find the minor key for that key signature. **Example 10** shows all of the sharp minor key signatures in order, and **Example 11** depicts all of the flat minor key signatures in order.



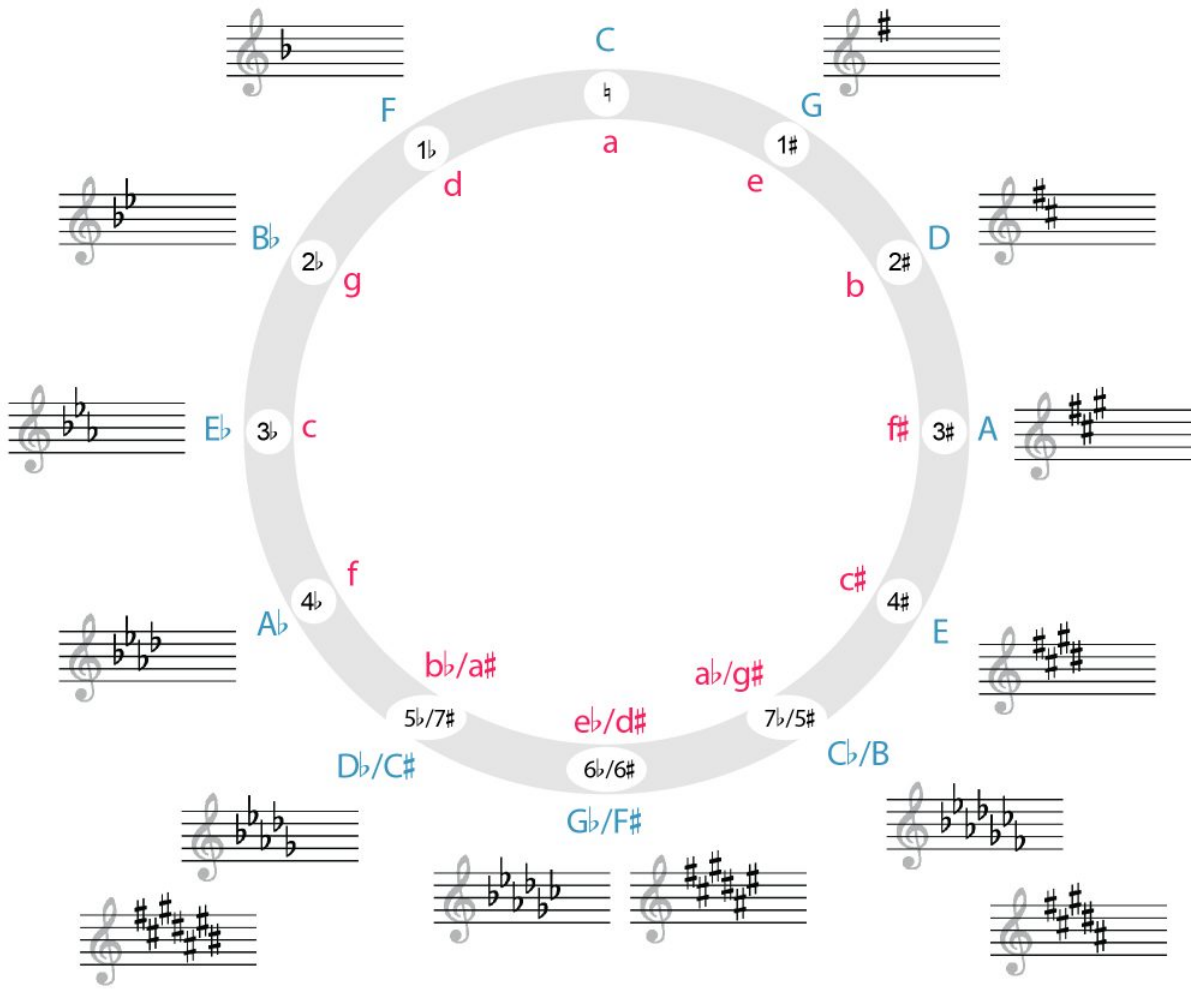


Example 10. *The key signatures of A, E, B, F♯, C♯, G♯, D♯, and A♯ minor.* ***Example 11.*** *The minor key signatures of A, D, G, C, F, B♭, E♭, and A♭ minor.*

Minor keys can also be imaginary (like imaginary major keys) if they contain double accidentals.

Minor Keys and the Circle of Fifths

The **circle of fifths** can be used as a visual for minor key signatures as well as major key signatures. Each key signature is placed alongside the corresponding major and minor keys. **Example 12** shows the circle of fifths for minor and major keys:



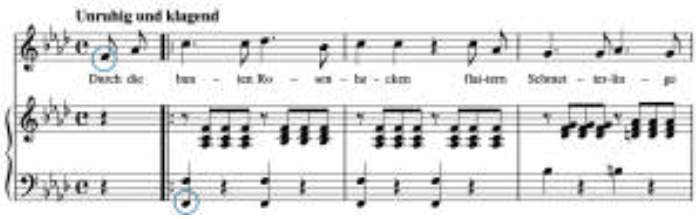
Example 12. *The circle of fifths for major and minor keys.*

In **Example 12**, major keys are in blue uppercase letters around the outside of the circle, while minor keys are in red lowercase letters around the inside of the circle. Once again, key signatures appear in order of their number of accidentals. If you start at the top of the circle (12 o'clock) and continue clockwise, key signatures add sharps, while if you start at the top of the circle and continue counterclockwise, they add flats. The bottom three key signatures can be written in sharps or flats, and so are **enharmonic**.

Major or Minor?

When you are given a piece of music to play or sing, the notation will often include a key signature, which will help you to narrow down the key of the work to two options: a major key and its relative minor.[2] But how can you tell which one the work is in? One thing that can help is to listen to and look at the first and last notes of the work—pieces often start and end on the tonic, so this can help you determine whether a work is major or minor.

Example 13 shows the first three measures of a song by Louise Reichardt (1779–1826) titled "Durch die bunten Rosenhecken" ("Through the colorful rose hedges"):



Example 13. *The first three measures of "Durch die bunten Rosenhecken."*

This example shows a vocal line (the top staff) and a piano part (the grand staff underneath the vocal part). The key signature contains four flats, which means we can narrow down the key of this work to A♭ major or F minor. In **Example 13**, the first note that is circled in the highest part (the vocalist) is is F, as is the first note that is circled in the lowest part (the lowest note played by the piano). Therefore, it is likely that the key of this work is F minor instead of A♭ major.

Online Resources

- Minor Scales Tutorial (musictheory.net)
- Minor Scales (Practical Chords and Harmonies)
- Minor Scales (YouTube)
- Scale Degree Names in Major and Minor (musictheory.net)
- Solfège History and Tutorial (Earlham College)
- Minor and Major Key Signatures (musictheory.net)
- Minor Key Signatures (YouTube)
- Minor Key Signature Flashcards (music-theory-practice.com) (be sure to click "minor" in the menu)
- The Circle of Fifths for Minor and Major (YouTube)
- The Circle of Fifths (Classic FM)

Assignments from the Internet

A. Natural Minor Scales (.pdf)
B. Harmonic Minor Scales (.pdf)
C. Melodic Minor Scales (.pdf)
D. Writing Minor Scales (.pdf, .pdf)
E. Writing Minor Key Signatures (.pdf)
F. Writing and Identifying Minor Key Signatures (.pdf)
G. Parallel and Relative Minor Questions (.pdf)
H. Scale Degree Names and Scale Degrees (.pdf)

Assignments

1. Writing Minor Scales (.pdf, .mscx)
2. Key Signatures: Minor (.pdf, .mscx)

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- Sharps and Flats in Different Clefs © Chelsey Hamm is licensed under a CC BY-SA (Attribution ShareAlike) license
- Minor Circle of Fifths © Wiki Commons adapted by Bryn Hughes is licensed under a CC BY-SA (Attribution ShareAlike) license
- Durch die bunten Rosenhecken © Louise Reichardt is licensed under a CC BY-NC-SA (Attribution NonCommercial ShareAlike) license

Footnotes

1. Interestingly, some studies suggest that the identification of "happy" and "sad" in Western classical music is somewhat universal, especially when based upon mode (major and minor). See Isabelle Peretz, "Towards a Neurobiology of Musical Emotions," in the *Handbook of Music and Emotion: Theory, Research, Applications*, eds. Patrik N. Juslin and John A. Sloboda. New York: Oxford University Press, 2010. ↵

2. The vast majority of Western classical works from 1700–1900 are in either major or minor. But outside of this time period and cultural context, you should also consider if the piece may be in a diatonic mode. This would expand the number of possible tonics indicated by a key signature. ↵

3.2: Minor Scales, Scale Degrees, and Key Signatures is shared under a not declared license and was authored, remixed, and/or curated by LibreTexts.

SECTION OVERVIEW

3.3: Introduction to Diatonic Modes and the Chromatic “Scale”

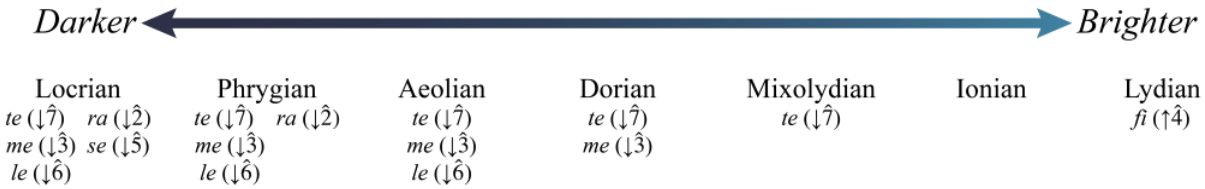
Key Takeaways

- The diatonic modes are scale-like collections of notes with patterns of half and whole steps.
- Modes can be described within a continuum of **modal brightness**: brighter modes sound more like a major scale, while darker modes sound more like a minor scale.
- The three bright modes, which contain *mi* (^33^) instead of *me* (↓^3↓3^), are **lydian**, **ionian**, and **mixolydian**.
- The four dark modes, which contain *me* (↓^3↓3^) instead of *mi* (^33^) are **dorian**, **aeolian**, **phrygian**, and **locrian**.
- A **chromatic "scale"**, also known as the chromatic collection, consists of twelve adjacent half steps. Chromatic scales are often (but not always) written with sharps while ascending and with flats while descending.
- *This book covers modes from many different angles. For more information on modes, check Chord-Scale Theory (jazz), Modal Schemas (pop), Diatonic Modes (20th/21st-c.), and Analyzing with Modes, Scales, and Collections (20th-/21st-c.).*

Modes and the Parallel Relationship

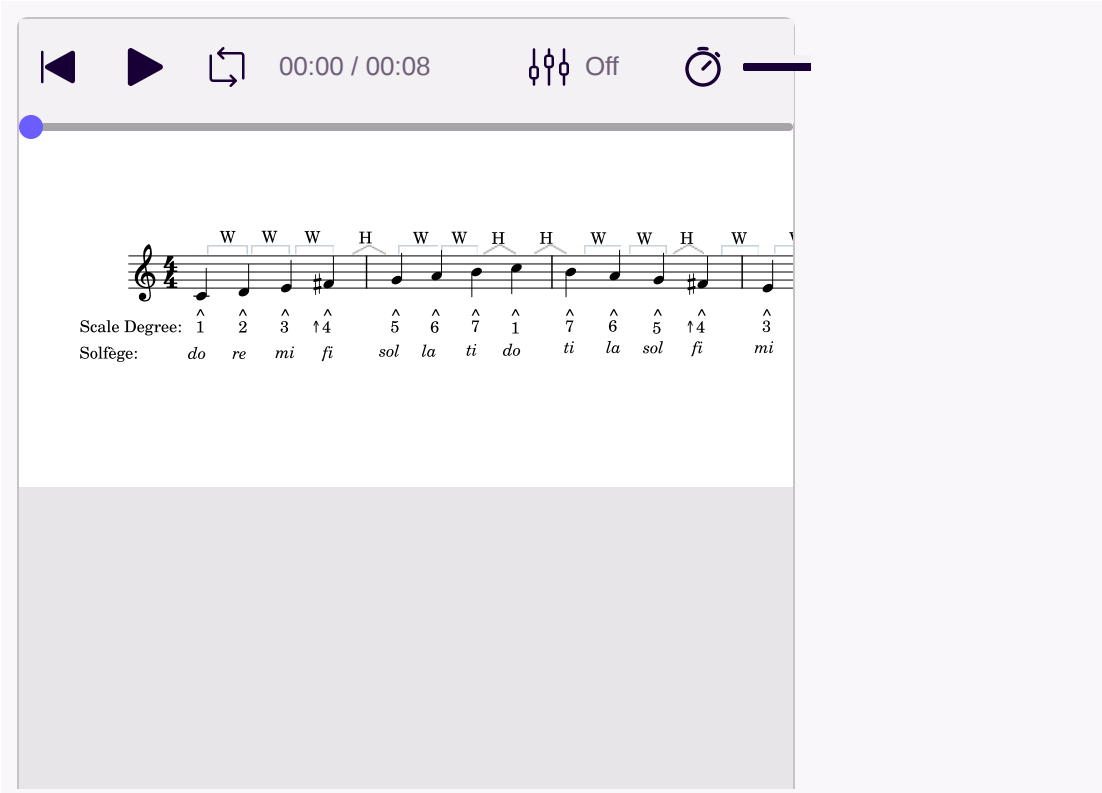
The diatonic modes are scale-like collections of notes with different patterns of half and whole steps. As we have learned previously, scales that share a tonic have a **parallel relationship**. In this chapter, modes are going to be described using the parallel relationship. Modes will also be described within a continuum of modal brightness; **modal brightness**: brighter modes sound more like a major scale, while darker modes sound more like a minor scale.

Example 1 ranks the seven diatonic modes in terms of relative brightness and darkness. It also summarizes which scale degrees are altered in relation to the ionian (major) mode, which will be explained in more detail below.



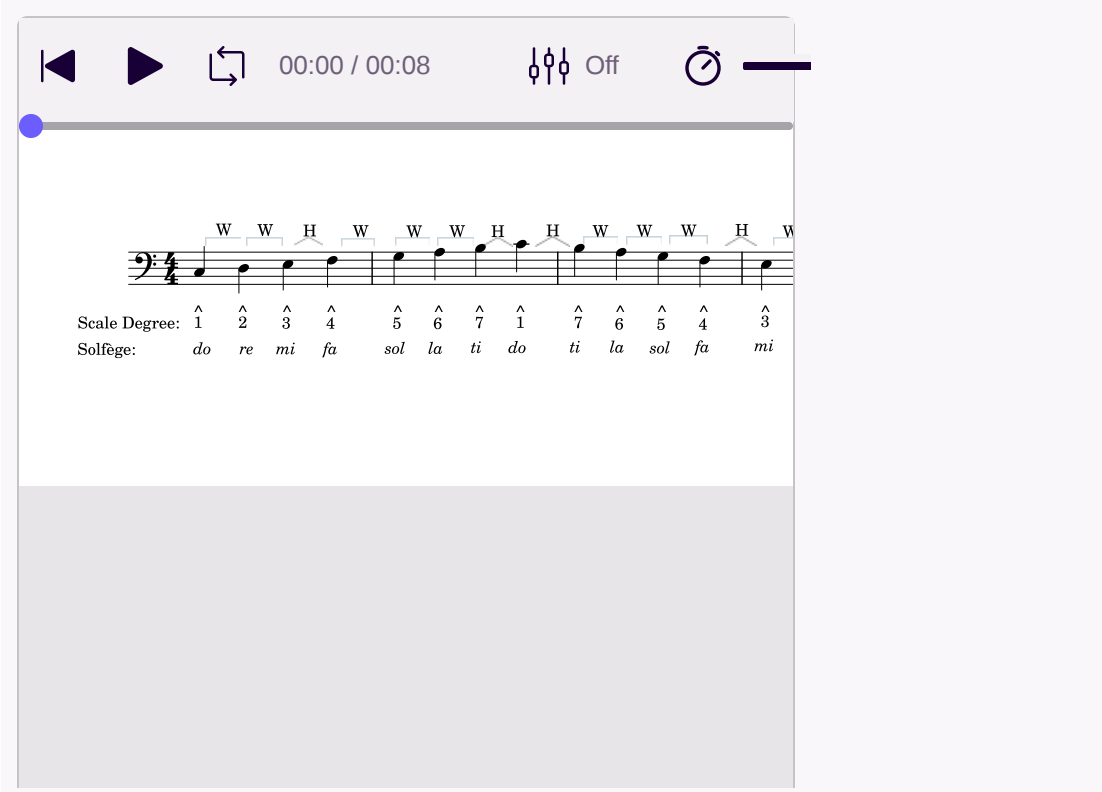
Example 1. *Relative darkness and brightness of modes.*

The brightest mode is the **lydian** mode. The ascending pattern of half and whole steps in this mode is W-W-W-H-W-W-H. Another way to think of this mode is as a major scale but with raised ^44^, whose solfège is *fi* (↑^4)(↑4^). **Example 2** shows C lydian with solfège.



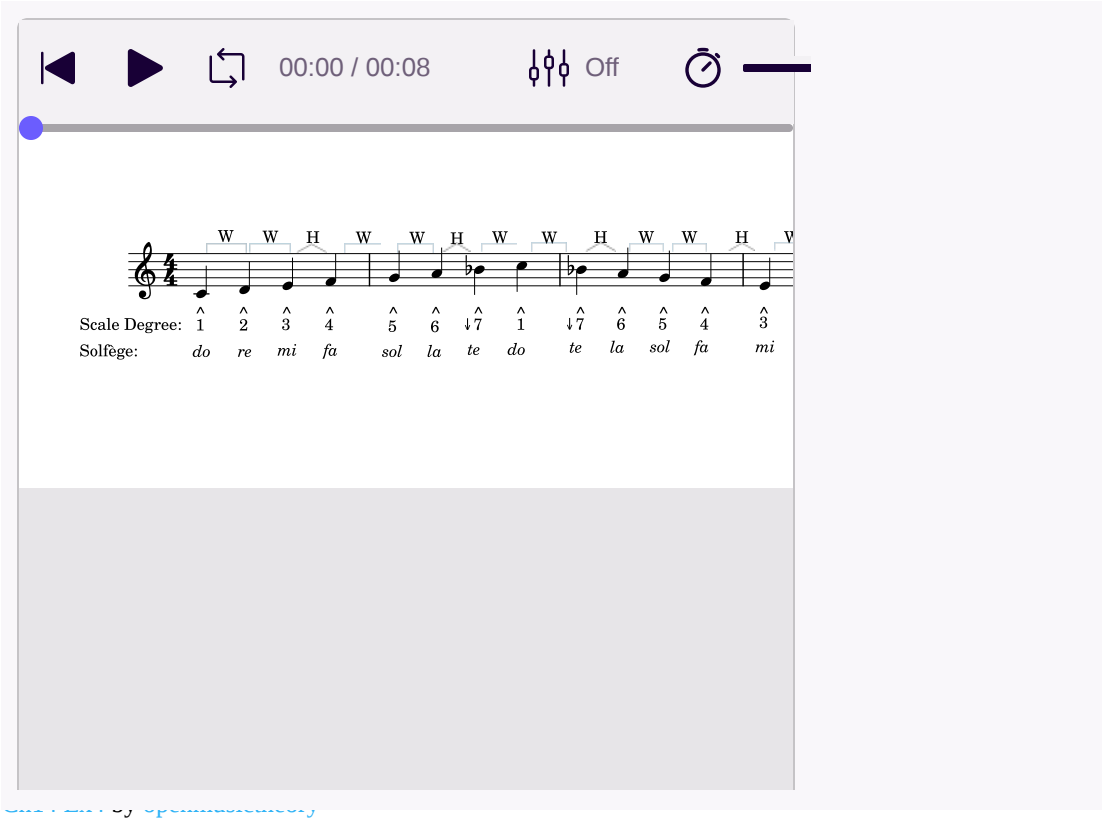
Example 2. *C lydian with solfège.*

The next brightest mode is the **ionian** mode. This mode consists of an ascending pattern of half and whole steps that is the same as a major scale: W-W-H-W-W-W-H. **Example 3** shows C ionian with solfège.



Example 3. *C ionian with solfège.*

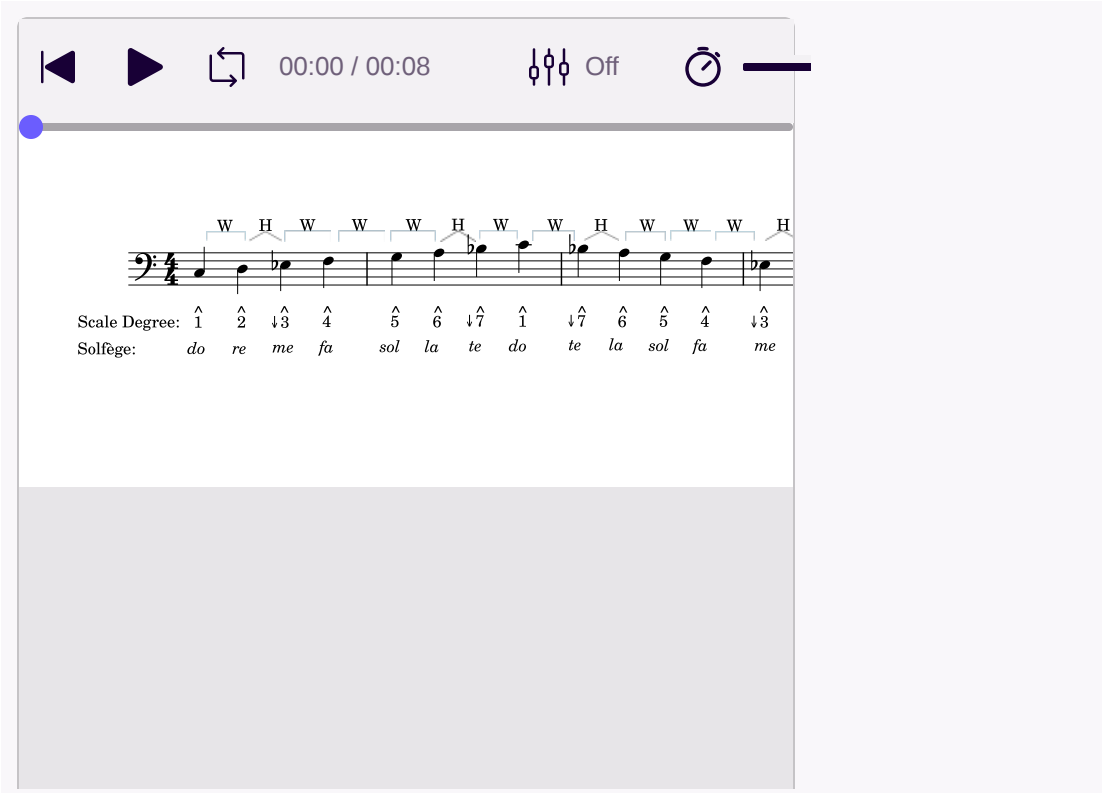
The next brightest mode is the **mixolydian** mode, with W-W-H-W-W-H-W as the ascending pattern of half and whole steps. Another way to think of this mode is as a major scale but with lowered ^77^. **Example 4** shows C mixolydian with solfège.



Example 4. *C mixolydian with solfège.*

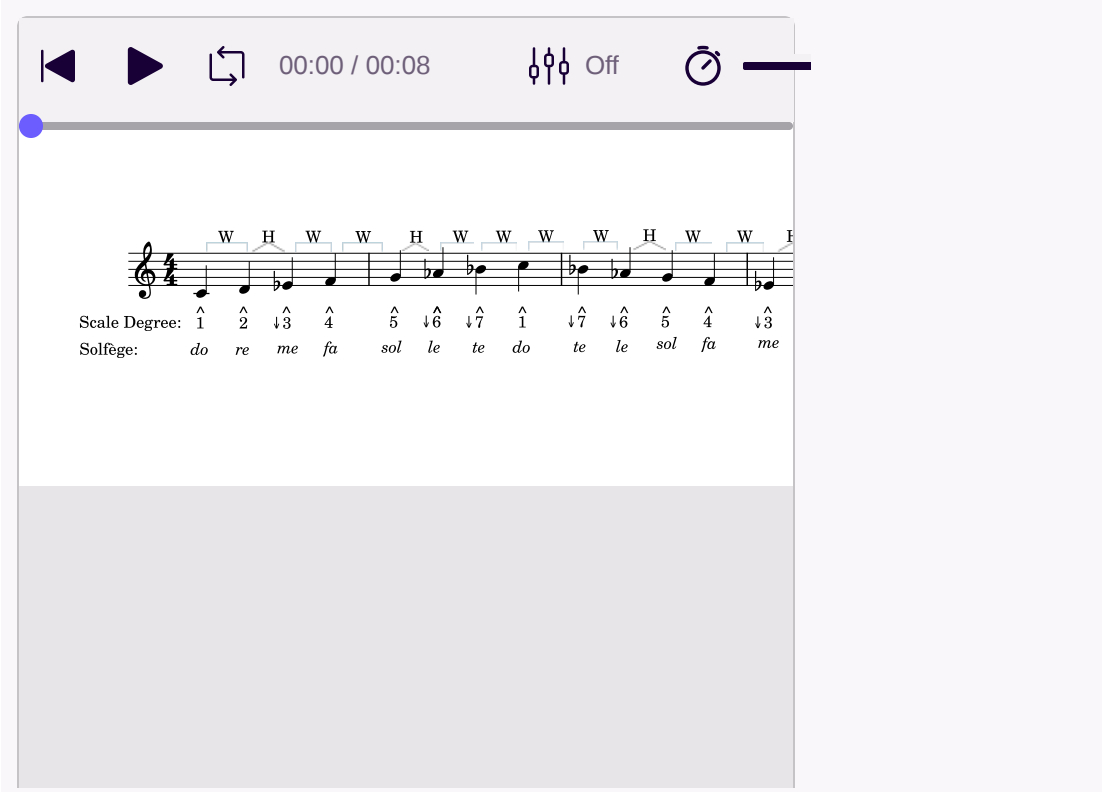
The lydian, ionian, and mixolydian modes are usually considered the brighter (or more major) modes because they contain *mi* instead of *me* (unaltered ^33^ instead of lowered ^33^). The dorian, aeolian, phrygian, and locrian modes are usually considered darker (or more minor) modes because they contain *me* instead of *mi* (↓^3↓3^ instead of unaltered ^33^).

The **dorian** mode is the first darker (or more minor) mode. This mode's ascending pattern of half and whole steps is W-H-W-W-W-H-W. Another way to think of this mode is as a minor scale but with raised ^66^ (*la*). **Example 5** shows C dorian with solfège:



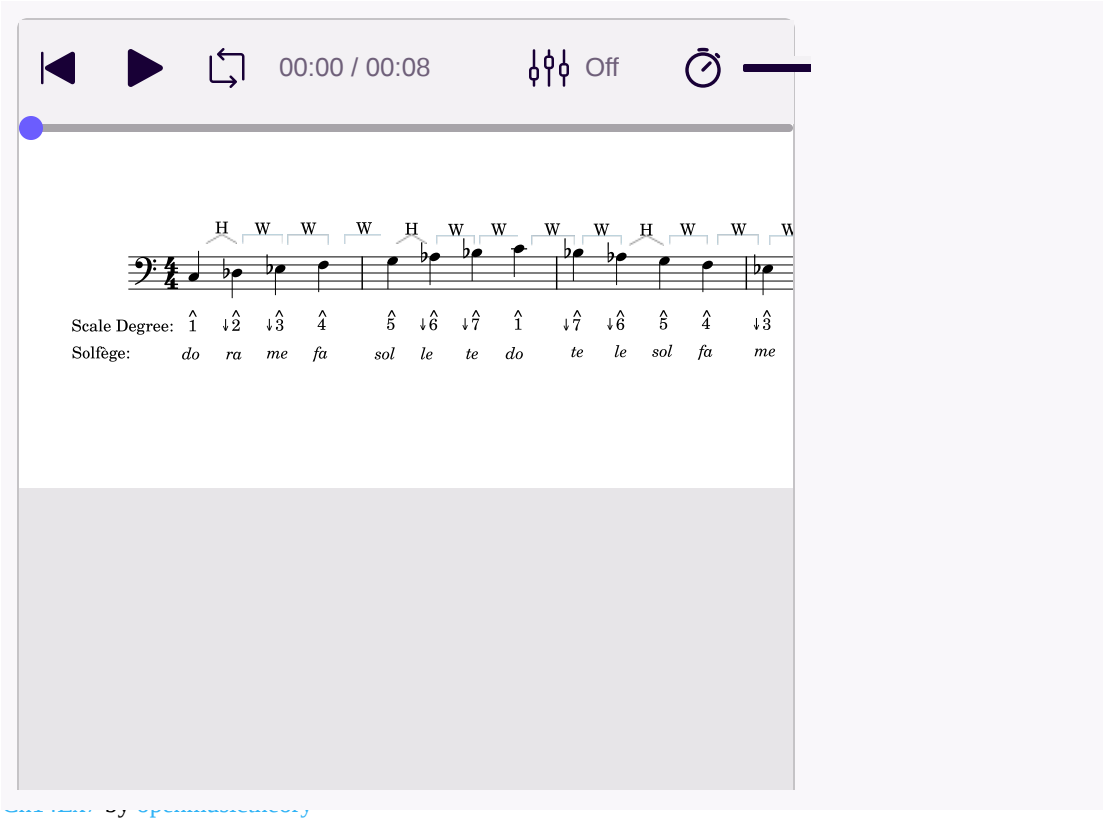
Example 5. *C dorian with solfège.*

The next darkest mode is the **aeolian** mode. The aeolian mode's ascending pattern of half and whole steps is the same as a natural minor scale: W-H-W-W-H-W-W. **Example 6** shows C aeolian with solfège.



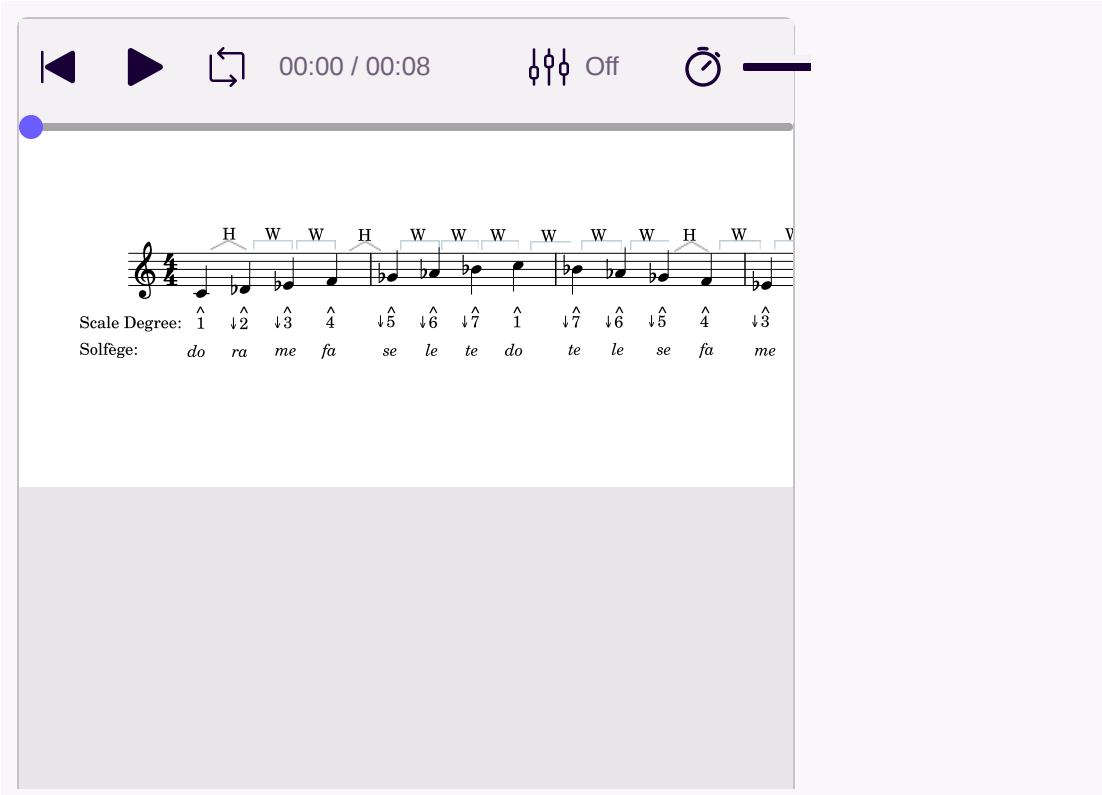
Example 6. *C aeolian with solfège.*

The next darkest mode is the **phrygian** mode. The ascending pattern of half and whole steps in the phrygian mode is H-W-W-W-H-W-W. This is the same pattern as a natural minor scale, but with lowered ^22^, whose solfège is *ra*. **Example 7** shows C phrygian with solfège:



Example 7. *C phrygian with solfège.*

The darkest mode is the **locrian** mode. The locrian mode's ascending pattern of half and whole steps is H-W-W-H-W-W-W. This is the same pattern as a natural minor scale, but with lowered ^22^ (*ra*) and lowered ^55^, whose solfège is *se*. **Example 8** shows C locrian with solfège:



Example 8. *C locrian with solfège.*

Each mode can start on any note. For example, one could build a mixolydian collection starting on D♭, an aeolian collection starting on G♭, or a lydian collection starting on F♯. When writing modal collections, be sure to think about your accidentals carefully.

Example 9 shows all of the different modes with scale degrees and solfège, ordered from brightest to darkest (lydian to locrian):

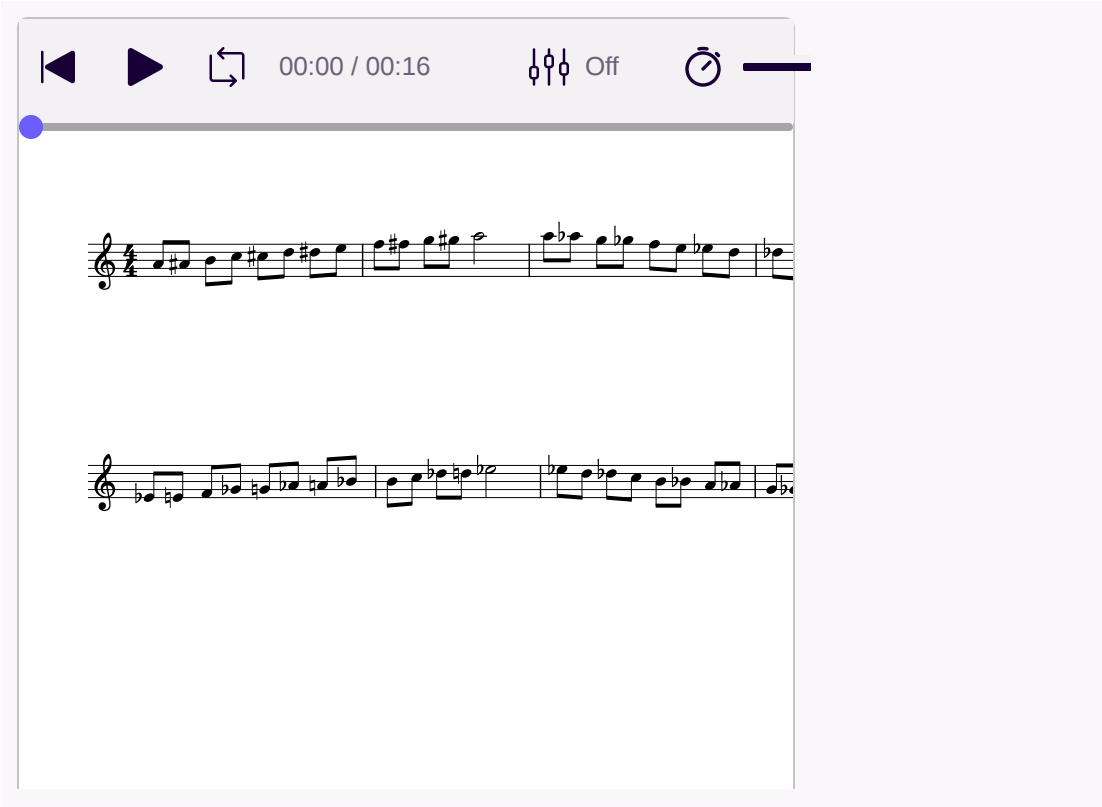
Ch14Ex3 by openmusictheory

Example 9. *The modes from brightest to darkest, starting on C, with scale degrees.*

Listen to **Example 9** carefully, observing the difference between the modes.

Chromatic “Scales”

A **chromatic "scale"** consists of twelve adjacent half steps. Because it lacks a pattern of half and whole steps, music theorists generally refer to it as a chromatic collection, which is why “scale” is in scare quotes here. **Example 10** shows two chromatic collections, the first starting on A and the second starting on E♭:



Example 10. Two chromatic collections starting on A and E♭.

As you can see in **Example 10**, chromatic collections are often (but not always) written with sharps while ascending and with flats while descending; the first line of this example demonstrates this. A chromatic collection that begins with a flat note (such as the second line in **Example 10**) is usually written with naturals while ascending and with flats while descending. When you write chromatic collections, don't forget that two pairs of white keys on the keyboard are half steps: B/C and E/F.

Online Resources

- Overview of the Modes and History (Classic FM)
- Modes from a Relative Conception (Learning Music)
- Modes Tutorial and Quiz (musictheoryfundamentals.com)
- Modes with Examples (fretello.com)
- Modes Identification Quiz (music-theory-practice.com)
- Chromatic Scales (Hello Music Theory)

Assignments from the Internet

A. Writing Modes (.pdf, .pdf), from a Relative Conception (.pdf)
B. Mode Identification and Accidental Error Detection (.pdf)
C. Dorian p. 1, and lydian p. 3 (.pdf)
D. Mode Writing and Questions (.docx, .docx)
E. Mode Identification (.pdf)
F. Chromatic Scales and Modes, p. 1 (.pdf)
G. Writing Chromatic Scales (.pdf)

Assignments

1. Writing Modes Assignment #1 (.pdf, .mscx)
2. Writing Modes Assignment #2 (.pdf, .mscx)
3. Writing Chromatic "Scales" Assignment #1 (.pdf, .mscx)
4. Writing Chromatic "Scales" Assignment #2 (.pdf, .mscx)

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CHAPTER OVERVIEW

4: Unit 4- Intervals

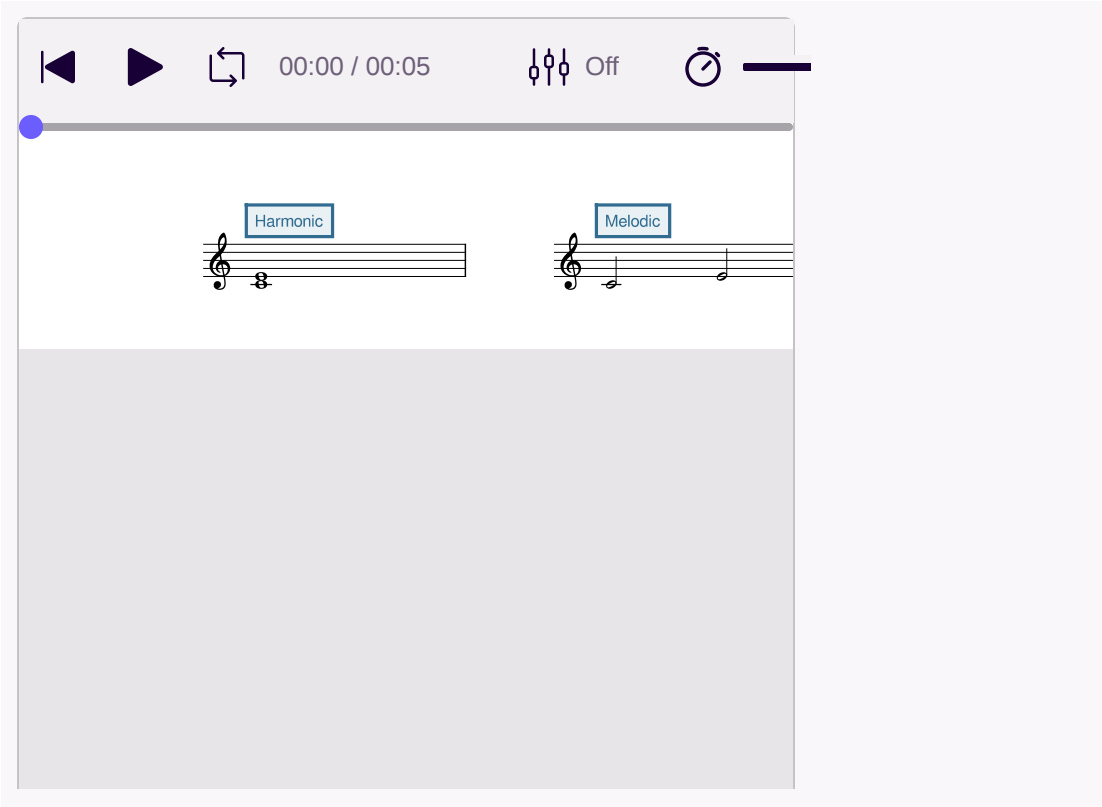
Key Takeaways

- Two pitches form an **interval**, which is usually defined as the distance between two notes.
- **Melodic intervals** are played or sung separately, while **harmonic intervals** are played or sung together.
- Every interval has a size and a quality. An interval's **size** is the distance between two notes on a staff—i.e., it is a measurement of the number of lines and spaces between two notes.
- Size is considered **generic**. In other words, it doesn't matter what accidentals you apply to the notes, the size is always the same.
- A **quality** makes an interval **specific** when used in combination with a size. Unisons, fourths, fifths, and octaves form perfect intervals, while seconds, thirds, sixths, and sevenths form major and minor intervals.
- Any interval can be augmented or diminished. **Augmented intervals** are one half step larger than a perfect or major interval. **Diminished intervals** are one half step smaller than a perfect or minor interval.
- Intervals between a unison and an octave are called **simple intervals**. Any interval larger than an octave is a **compound interval**.
- **Intervallic inversion** occurs when two notes are "flipped." When you need to identify an interval where the lower note is the tonic of a difficult or imaginary major key, inverting the interval can help.
- **Consonant** intervals are intervals that are considered more stable, as if they do not need to resolve, while **dissonant** intervals are considered less stable, as if they do need to resolve

Two pitches form an **interval**, which is usually defined as the distance between two notes. But what does an interval measure? Physical distance on the staff? Difference in wavelength between pitches? Something else? Music theorists have had contradictory ideas on the definition of "interval," and these definitions have varied greatly with **milieu**. This chapter will focus on intervals as a measure of two things: written distance between two notes on a staff, and an aural "distance" (or space) between two sounding pitches. It will be important to keep in mind at all times that intervals are both written and aural, so that you are thinking of them musically (and not simply as an abstract concept that you are writing and reading).

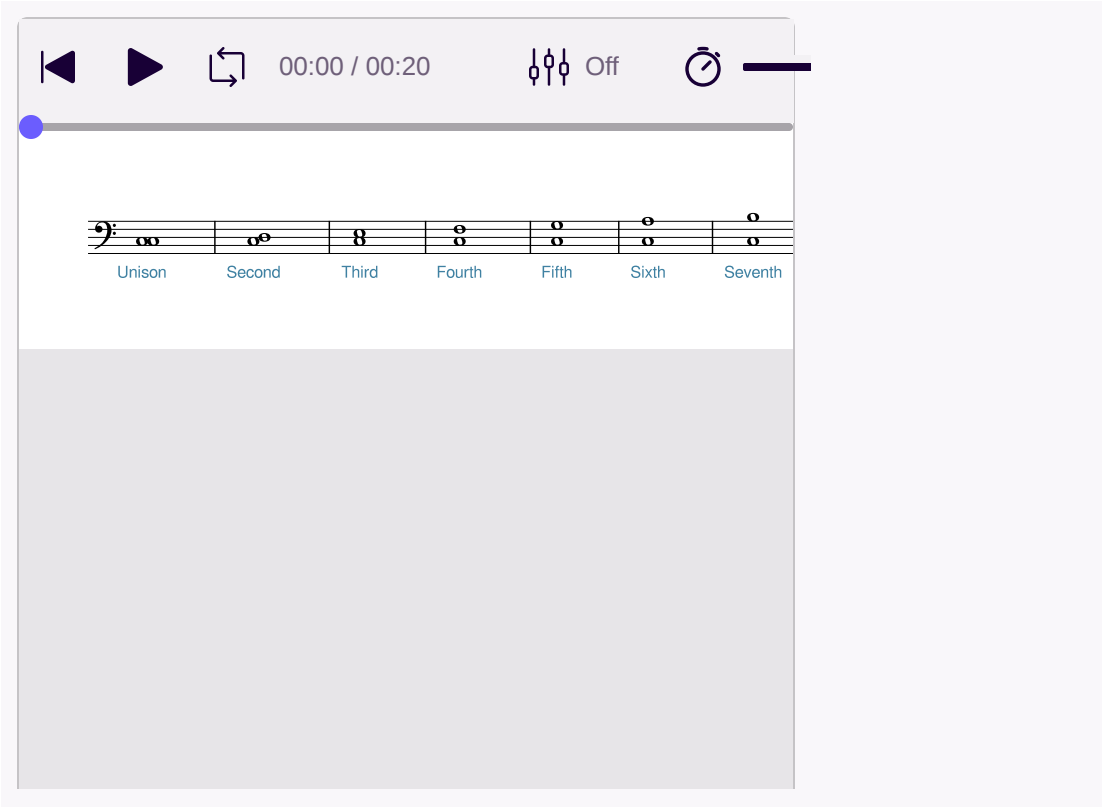
Size

Intervals can be melodic (played or sung separately) or harmonic (played or sung together). In **Example 1**, the notes in the first measure sound together (harmonically), while in the second measure, they sound separately (melodically).



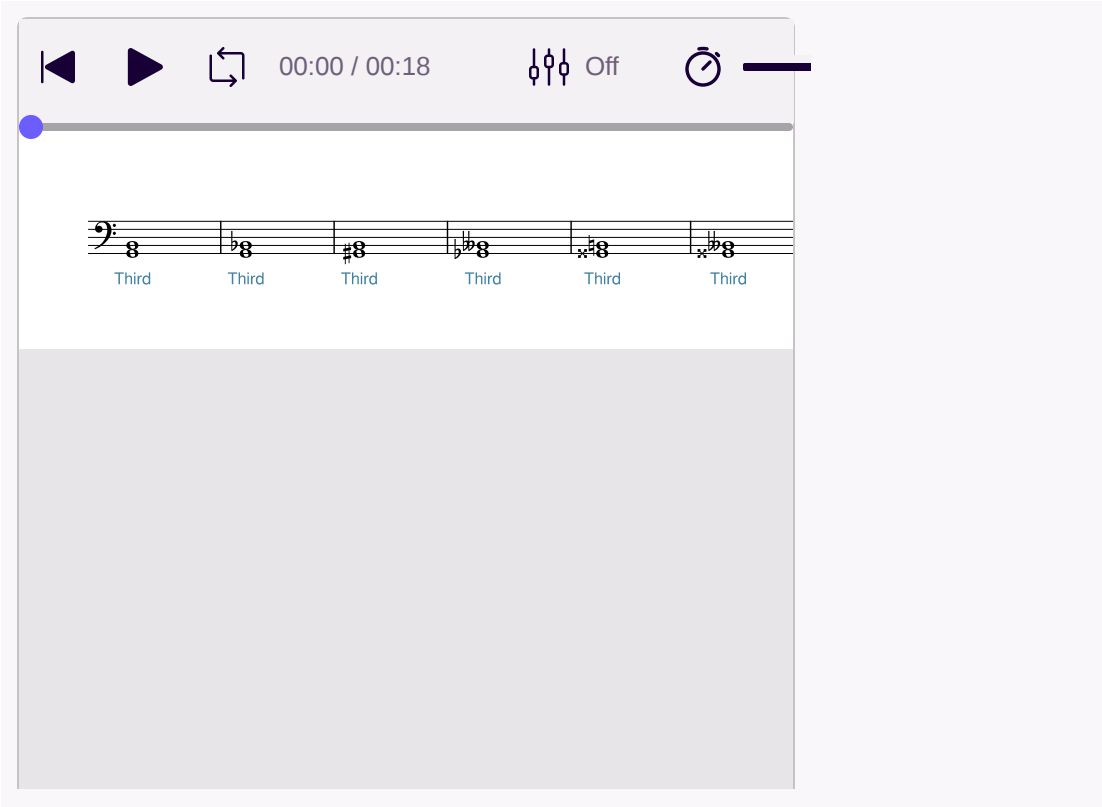
Example 1. *A harmonic and a melodic interval.*

Every interval has a size and a quality. A **size** is the distance between two notes on a staff—i.e., it is a measurement of the number of lines and spaces between two notes. Sizes are written with Arabic numbers (2, 3, 4, etc.); however, they are spoken with ordinal numbers (second, third, fourth, fifth, sixth, seventh, etc.). Always begin with "one" when counting size. **Example 2** shows the eight sizes within a C major scale. As you can see, the sizes are labeled with ordinal numbers, with two exceptions: the interval between two notes on the same line or space is called a "unison," not a "first," and notes eight lines and spaces apart are said to be an "octave," not an "eighth."



Example 2. *Sizes of intervals.*

Size is considered **generic**. In other words, it doesn't matter what accidentals you apply to the notes—the size is always the same. **Example 3** demonstrates this: despite the different accidentals, each of these intervals is a third (or "generic third") because there are three lines/spaces between the two notes.



Example 3. Accidentals do not affect an interval's generic size.

Perfect, Major, and Minor Qualities

A **quality** makes an interval **specific** when used in combination with a size. Quality more precisely measures written distance between notes, and—in combination with an interval's size—it describes the aural sound of an interval.

There are five possible interval qualities:

- Augmented (designated as A or +)
- Major (ma)
- Perfect (P)
- Minor (mi)
- Diminished (d or ^{o})

The quality comes before the size when saying or writing an interval. For example, an interval could be described as a "perfect fourth" (abbreviated P4), a "minor third" (abbreviated mi3), or an "augmented second" (abbreviated +2 or A2).

For now, we will only discuss three qualities: perfect, major, and minor. Different theorists (in different locations and time periods) have applied these qualities to different sizes of intervals, depending on **milieu**. **Example 4** shows how these qualities are applied today. The left column shows that seconds, thirds, sixths, and sevenths are major and/or minor, while the right column shows that unisons, fourths, fifths, and octaves are perfect intervals.

Major/Minor	Perfect
2nds	Unisons
3rds	4ths
6ths	5ths
7ths	Octaves

Example 4. Interval qualities.

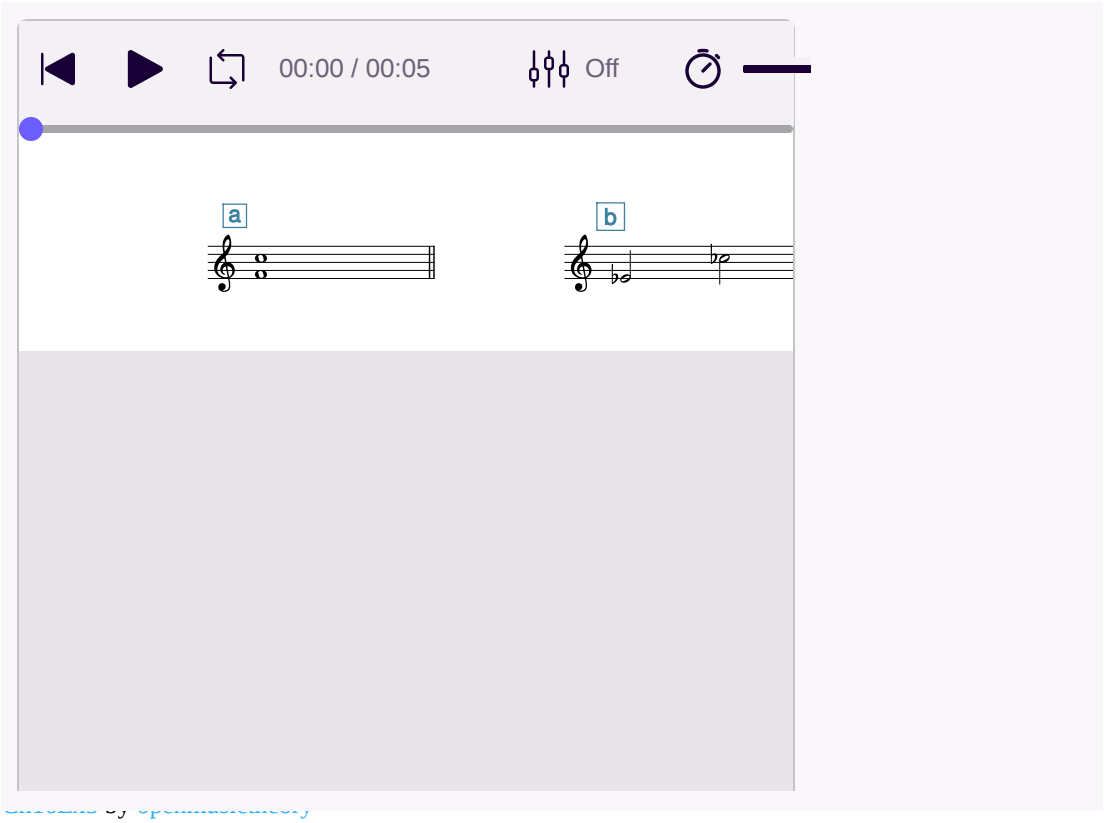
The “Major Scale” Method for Determining Quality

There are several different methods for learning to write and identify qualities of intervals. One method you may have heard of is counting half steps. We do not recommend this method, because it is time consuming and often inaccurate. Instead, we recommend using what you know about **major scales** to identify interval quality.

To identify an interval (size and quality) using this method, complete the following steps:

1. Determine size (by counting lines and spaces between the notes).
2. Imagine that the bottom note of the interval is the tonic of a major scale.
3. Determine whether or not the top note is in the bottom note’s major scale (imagined in step 2) and assign the corresponding quality.
4. If it is: the interval is perfect (if it is a unison, fourth, fifth, or octave) or major (if it is a second, third, sixth, or seventh). If it is not: the interval could be minor (a lowered second, third, sixth, or seventh), or it could be augmented or diminished, which will be covered in the next section.

Example 5 shows two intervals. Try identifying their size and quality:



Example 5. *Two intervals.*

In **Example 5a**, the notes are F and C in treble clef. Here is how you would use the “Major Scale” method to identify the interval:

1. First, this interval is a generic fifth (F to itself is 1; to G is 2; to A is 3; to B is 4; to C is 5).
2. Second, C is within the key of F major (which has one flat, B♭).
3. Therefore, the interval is a perfect fifth.

Let’s now use this process for **Example 5b**. The notes in this example are E♭ and C♭ in treble clef. Let’s go through the same process again:

1. First, this interval is a generic sixth (E♭ to itself is 1; to F is 2; to G is 3; to A is 4; to B is 5; to C is 6).
2. Second, C♭ is *not* in the key of E♭ major (which has three flats: B♭, E♭, and A♭).

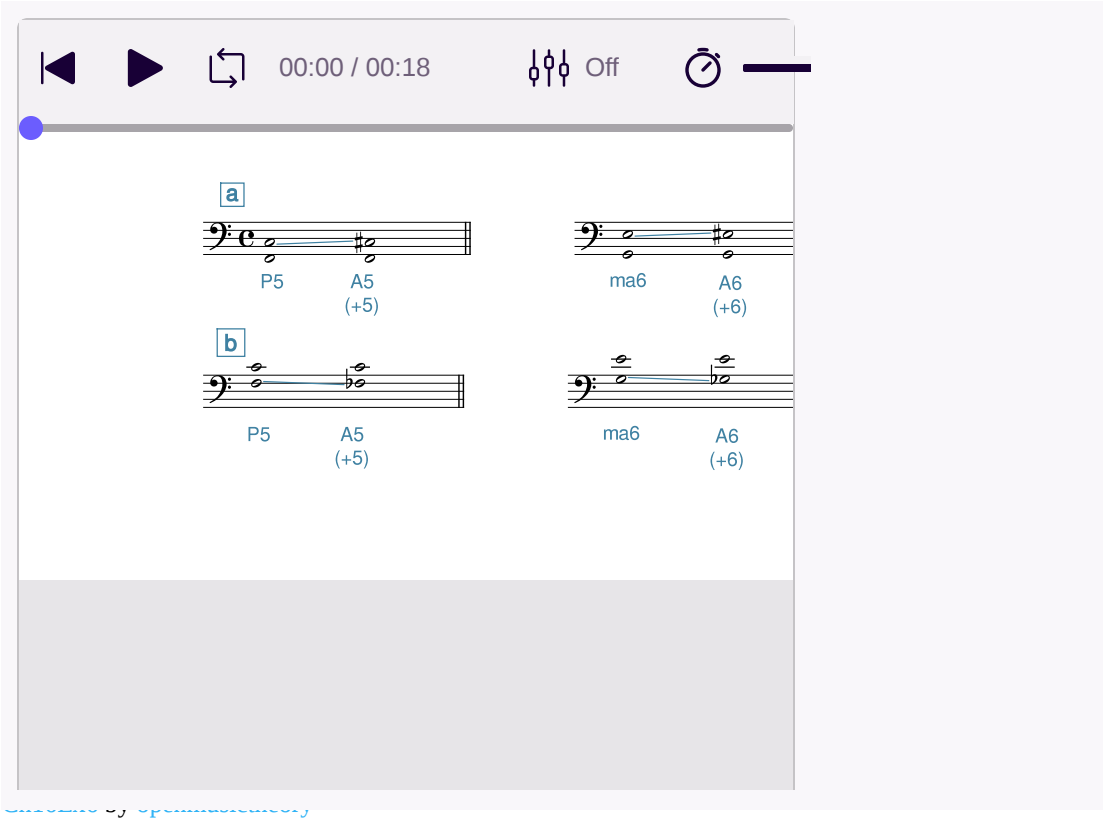
3. Therefore, this is a minor sixth. If it were a major sixth, then the C would have to be C♮ instead of C♭, because C♮ is in the key of E♭ major.

Augmented and Diminished Qualities

To review, there are five possible interval qualities, of which we have covered major, minor, and perfect:

- Augmented (designated as A or +)
- Major (ma)
- Perfect (P)
- Minor (mi)
- Diminished (d or °)

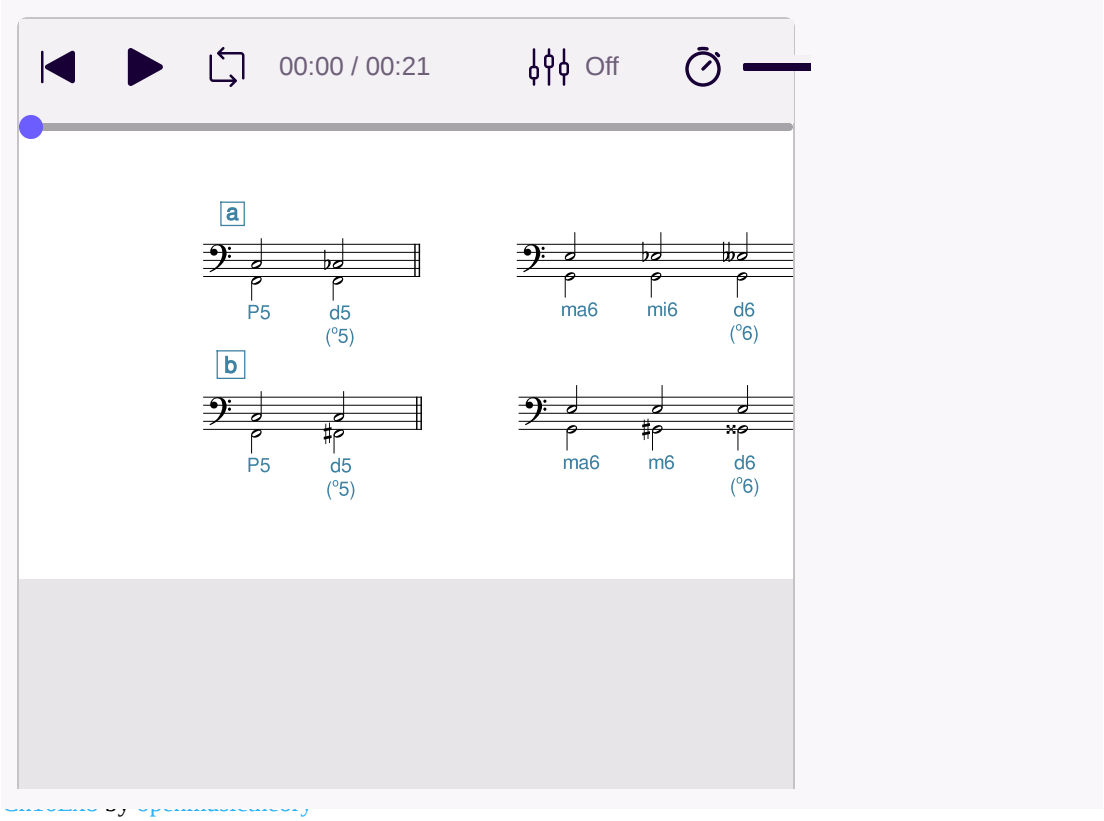
Augmented intervals are one half step larger than a perfect or major interval. The first measure of **Example 6a** first shows the notes F and C, which form a perfect fifth (because C is in the key of F major). The top note of this interval is then raised by a half step to a C♯, making the interval one half step larger. The interval from F to C♯ is therefore an augmented fifth (abbreviated as either A5 or +5). In the second measure of **Example 6a**, the first interval is a major sixth between G and E (because E is in the key of G major). The top note is then raised by a half step to E♯, making the interval into an augmented sixth (A6 or +6). The bottom note of an interval can be altered as well. In the first measure of **Example 6b**, the perfect fifth F–C is turned into an augmented fifth by lowering the F by a half step to F♭, which makes the interval one half step larger than a perfect fifth. In the second measure of **Example 6b**, the major sixth G–E is turned into an augmented sixth by lowering the G by a half step to G♭.



Example 6. *Augmented intervals created by (a) raising the top note and (b) lowering the bottom note.*

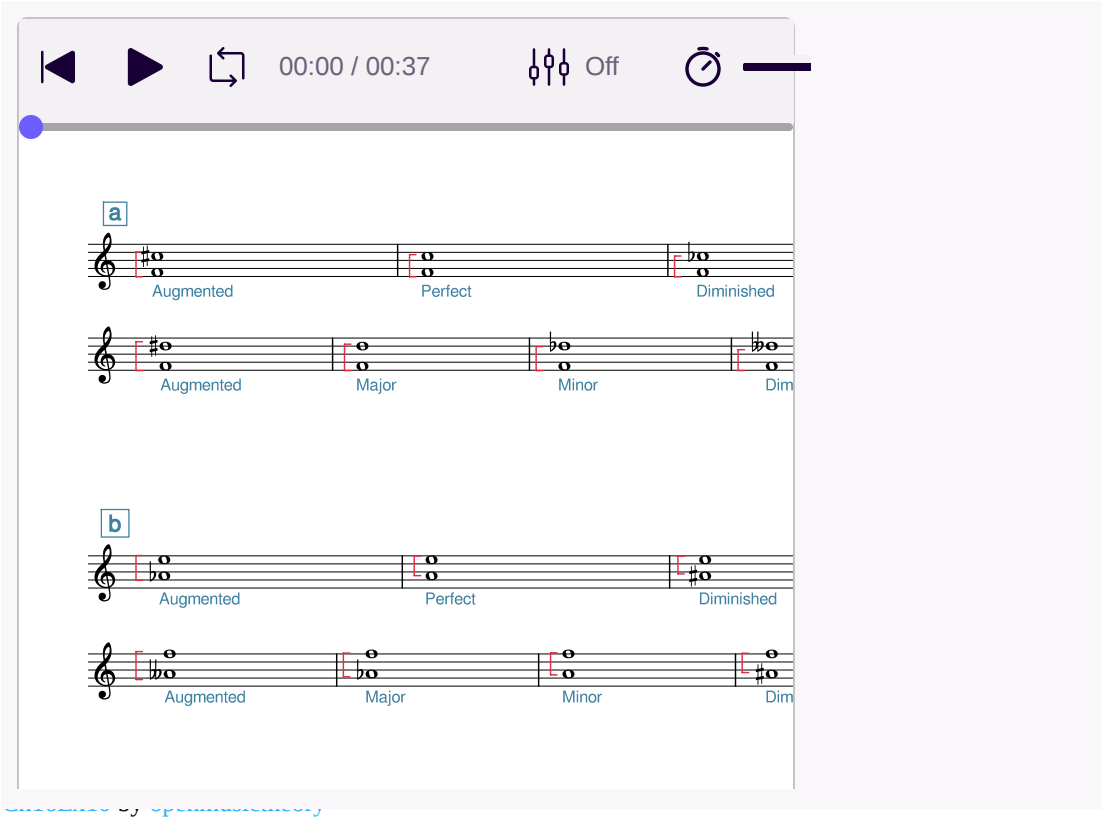
Diminished intervals are one half step smaller than a perfect or minor interval. In the first measure of **Example 7a**, the perfect fifth F–C is made a half step smaller by lowering the top note to C♭, forming a diminished fifth (also called a **tritone**, usually abbreviated as d5 or °5). In the second measure, G–E form a major sixth, which becomes a minor sixth when the top note is lowered by a half step. The minor sixth then becomes a diminished sixth when the top note is lowered again to E𝄫. Note that contracting an interval by one half step turns perfect and minor intervals into diminished intervals, but it turns major intervals into minor intervals. Again, it is not always the top note that is altered. In **Example 7b**, the perfect fifth F–C becomes diminished when the bottom note moves up a half step to F♯. In the second measure, the major sixth G–E first becomes a minor sixth when the G

moves up a half step to G♯. This minor interval then becomes diminished when the G♯ moves to G𝄪 in the third measure, further contracting the interval by another half step.



Example 7. *Diminished intervals created by (a) lowering the top note and (b) raising the bottom note.*

Example 8 again demonstrates and summarizes the relative size of intervals. Each bracket in this example is one half step larger or smaller than the brackets to its right and left. In **Example 8a**, the interval quality is changed by altering the top note with accidentals. As you can see, intervals one half step larger than perfect or major intervals are augmented; intervals one half step smaller than major intervals are minor; and intervals one half step smaller than perfect or minor intervals are diminished. **Example 8b** outlines the same qualities as **10a**, only with the bottom note altered by accidentals instead of the top note.



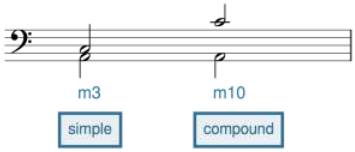
Example 8. *Relative size of intervals with (a) the top note altered and (b) the bottom note altered.*

Doubly and Triply Augmented and Diminished Intervals

Intervals can be further contracted or expanded outside of the augmented and diminished qualities. An interval a half step larger than an augmented interval is a **doubly augmented interval**, while an interval a half step larger than a doubly augmented interval is a **triply augmented interval**. Likewise, an interval a half step smaller than a diminished interval is a **doubly diminished interval**, while an interval a half step smaller than a doubly diminished interval is a **triply diminished interval**.

Compound Intervals

The intervals discussed above, from unison to octave, are **simple intervals**, which have a size of an octave or smaller. Any interval larger than an octave is a **compound interval**. In **Example 9**, the notes A and C first form a minor third (a simple interval). When the C is brought up an octave in the second pair of notes, the interval becomes a minor tenth (a compound interval). Quality remains the same for simple intervals and their corresponding compound intervals.



Example 9. *A simple and compound interval.*

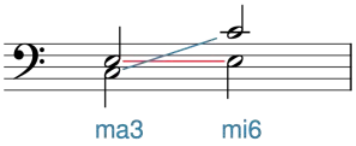
If you want to make a simple interval a compound interval, add 7 to its size. Consequently:

- Unisons (which get the number 1) become octaves (8s)
- 2nds become 9ths
- 3rds become 10ths
- 4ths become 11ths
- 5ths become 12ths
- 6ths become 13ths

These are the most common compound intervals that you will encounter in your music studies. Remember that octaves, 11ths, and 12ths are perfect like their simple counterparts, while 9ths, 10ths, and 13ths are major/minor.

Intervallic Inversion

Intervallic inversion occurs when two notes are "flipped." In **Example 10**, for instance, an interval with C on the bottom and E on the top is inverted by moving the C up by an octave. You might be wondering: why is this important? There are two reasons: first, because inverted pairs of notes share many interesting properties (which are sometimes exploited by composers), and second, because inverting a pair of notes can help you to identify or write an interval when you do not want to work from the given bottom note.



Example 10. *Intervallic inversion.*

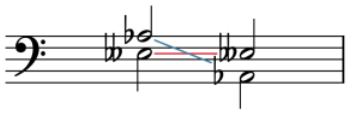
Let's start with the first point: the interesting properties. First, the size of inverted pairs always adds up to 9:

- Unisons (1s) invert to octaves (8s) (1 + 8 = 9) and octaves invert to unisons.
- Seconds invert to sevenths (2 + 7 = 9) and sevenths invert to seconds.
- Thirds invert to sixths (3 + 6 = 9) and sixths invert to thirds.
- Fourths invert to fifths (4 + 5 = 9) and fifths invert to fourths.

Qualities of inverted pairs of notes are also very consistent:

- Perfect intervals invert to perfect intervals.
- Major intervals invert to minor intervals (and minor intervals to major intervals).
- Augmented intervals invert to diminished intervals (and diminished intervals to augmented intervals).

With that information, you can now calculate the inversions of intervals without even looking at staff paper. For example: a major seventh inverts to a minor second, an augmented sixth inverts to a diminished third, and a perfect fourth inverts to a perfect fifth.



Example 11. *Inverting an interval may help with identification by putting a simpler note on the bottom.*

Now for the second point: sometimes you will come across an interval that you do not want to calculate or identify from the bottom note. In the interval E𝄫–A♭ written in **Example 11**, for instance, identifying the interval using the "Major Scale" method would not work—the bottom note is E𝄫, and there is no key signature for this note (its key signature is "imaginary"). So, if you were given this interval to identify, you might consider inverting the interval. Now the inversion of the interval can be calculated from the non-imaginary key of A♭ major. The key of A♭ major has four flats (B♭, E♭, A♭, and D♭). An E♭ above A♭ would therefore be a perfect fifth; however, this interval has been contracted (made a half step smaller) because the E♭ has been lowered to E𝄫. That means this interval is a d5 (diminished fifth).

Now that we know the inversion of the first interval is a d5, we can calculate the original interval. A diminished fifth inverts to an augmented fourth (because diminished intervals invert to augmented intervals and because five plus four equals nine). Thus, the first interval is an augmented fourth (A4).

Consonance and Dissonance

Intervals are categorized as **consonant** or **dissonant**. Consonant intervals are intervals that are considered more stable, as if they do not need to resolve, while dissonant intervals are considered less stable, as if they do need to resolve. These categorizations have varied with **milieu**. **Example 12** shows a table of melodically consonant and dissonant intervals:

Melodically Consonant			Melodically Dissonant
	Perfect Intervals		Augmented Intervals
	ma2, mi2		Diminished Intervals
	ma3, mi3		ma7, mi7
	ma6, mi6		

Example 12. *Melodically consonant and dissonant intervals.*

Example 13 shows harmonically consonant and dissonant intervals:

Harmonically Consonant	Harmonically Dissonant
ma3, mi3	ma2, mi2
ma6, mi6	Augmented Intervals
P1, P8, P5	Diminished Intervals
	ma7, mi7
	P4

Example 13. *Harmonically consonant and dissonant intervals.*

The implications of consonant and dissonant intervals are discussed further in the Introduction to Species Counterpoint.

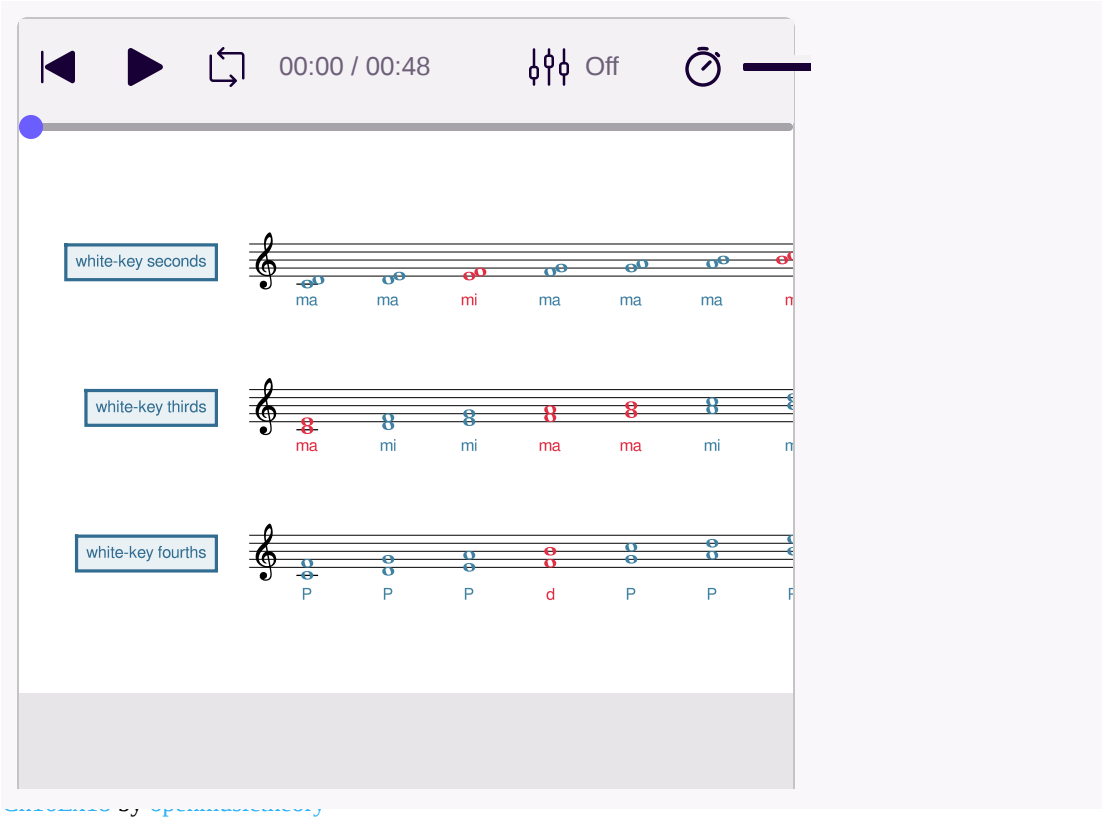
Another Method for Intervals: The White-Key Method

Ultimately, intervals need to be committed to memory, both aurally and visually. There are, however, a few tricks to learning how to do this quickly. One such trick is the so-called “white-key method,” which refers to the piano keyboard.

This method requires you to memorize all of the intervals found between the white keys on the piano (or simply all of the intervals in the key of C major). Once you’ve learned these, any interval can be calculated as an alteration of a white-key interval. For example, we can figure out the interval for the notes D and F♯ if we know that the interval D to F is a minor third and this interval has been made one semitone larger: a major third.

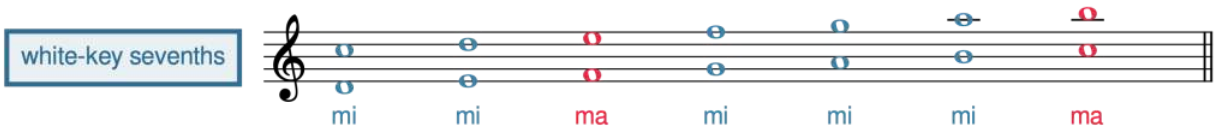
Conveniently, there is a lot of repetition of interval size and quality among white-key intervals, summarized in **Example 14**. Memorize the most frequent type and the exceptions.

- All of the seconds are major except for two: E–F and B–C.
- All of the thirds are minor except for three: C–E, F–A, and G–B, which are major.
- All of the fourths are perfect except for one: F–B, which is an augmented fourth (a **tritone**).



Example 14. *White-key seconds, thirds, and fourths.*

Believe it or not, you now know all of the white-key intervals, as long as you understand the concept of **intervallic inversion**, which was previously explained. For example, if you know that all seconds are major except for E–F and B–C (which are minor), then you know that all sevenths are minor except for F–E and C–B (which are major), as seen in **Example 15.**



Example 15. *White-key sevenths.*

Once you've mastered the white-key intervals, you can figure out any other interval by taking into account any accidentals applied to the notes.

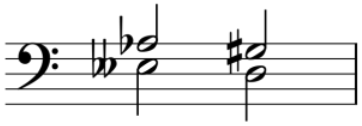
Intervallic Enharmonic Equivalence

Example 16 may be useful when thinking about **enharmonic equivalence** of intervals. In this chart, the columns are different intervallic sizes, while the rows present intervals based on the number of half steps they contain. Each row in this chart is enharmonically equivalent. For example, a major second (ma2) and diminished third (d3) are enharmonically equivalent (both are two half steps). Likewise, an augmented fourth (A4) and diminished fifth (d5) are enharmonically equivalent—both are six half steps in size.

number of semitones	unis.	2nd	3rd	4th	5th	6th	7th	oct.
0	P1	d2						
1	A1	mi2						
2		ma2	d3					

number of semitones	unis.	2nd	3rd	4th	5th	6th	7th	oct.
3		A2	mi3					
4			ma3	d4				
5			A3	P4				
6				A4	d5			
7					P5	d6		
8					A5	mi6		
9						ma6	d7	
10						A6	mi7	
11							ma7	d8
12							A7	P8

Example 16. *Enharmonic equivalence of intervals.*



Example 17. *Use enharmonic equivalence to aid in identifying difficult intervals.*

Intervallic enharmonic equivalence is useful when you come across an interval that you do not want to calculate or identify from the bottom note. We have already discussed one method for this situation previously, which was intervallic inversion. You may prefer one method or the other, though both will yield the same result. **Example 17** reproduces the interval from **Example 11**. As you'll recall, there is no key signature for the bottom note (E𝄫), making identification of this interval difficult. By using enharmonic equivalence, however, we can identify this interval more easily, recognizing that E𝄫 is enharmonically equivalent with D and that A♭ is enharmonically equivalent with G♯. Now we can identify the interval as an A4 (augmented fourth), using the key signature of the enharmonically equivalent bottom note (D).

Online Resources

- Specific Intervals (musictheory.net)
- Interval Introduction (Robert Hutchinson)
- Intervals (Hello Music Theory)
- Diminished and Augmented Intervals (Open Textbooks)
- Diminished and Augmented Intervals (Robert Hutchinson)
- Compound Intervals (Hello Music Theory)
- Interval Inversion (musictheory.net)
- Interval Ear Training (musictheory.net)
- Interval Ear Training (Tone Dear)
- Interval Ear Training (teoria)
- Interval Identification (musictheory.net)
- Keyboard Interval Identification (musictheory.net)

Assignments from the Internet

A. Interval Identification (.pdf, .pdf, .pdf), in Major Keys (.pdf), in Minor Keys (.pdf)
B. Interval Identification and Construction, pp. 18–19 (.pdf)
C. Interval Construction (.pdf, .pdf)
D. Compound Intervals, pp. 15–17 (.pdf)

Assignments

1. Writing and Identifying Intervals Assignment #1 (.pdf, .mcsz)
2. Writing and Identifying Intervals Assignment #2 (.pdf, .mcsz)
3. Writing and Identifying Intervals Assignment #3 (.pdf, .mcsz)

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CHAPTER OVERVIEW

5: Unit 5- Triads

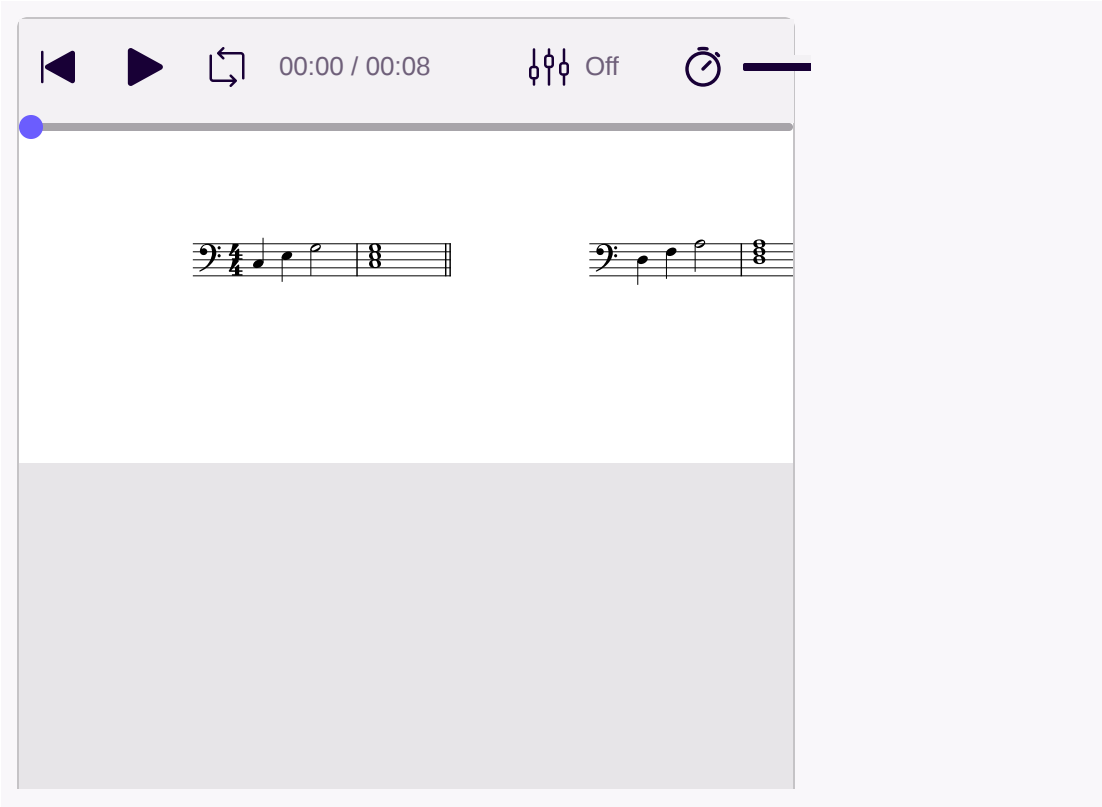
Key Takeaway

- A **triad** is a three-note chord whose notes can be arranged in thirds. A triad can always be “stacked” so that its notes are either on all lines or all spaces.
- When a triad is stacked in its most compact form in thirds, the lowest note is called the **root**, the middle note is called the **third**, and the highest note is called the **fifth**.
- There are four qualities of triad. A **major triad's** third is major and its fifth is perfect, while a **minor triad's** third is minor and its fifth is perfect. A **diminished triad's** third is minor and its fifth is diminished, while an **augmented triad's** third is major and its fifth is augmented.
- In **chord symbols**, major triads are represented with capital letters that correspond to the triad’s root. Minor triads have a lowercase “mi” after the letter, diminished triads have a superscript circle (º), and augmented triads have a plus sign (+). You may see other abbreviations in other contexts (a more exhaustive list is given in the Chord Symbols chapter).
- Within major and minor keys, triads have particular qualities that correspond to scale degree. These are the same in every major and minor key, which makes memorizing them useful.
- Triads are identified by their **root**, **quality**, and **inversion**.

A **chord** is any combination of three or more pitch classes that sound simultaneously. This chapter focuses on **triads**—three-note chords whose notes can be stacked into thirds.

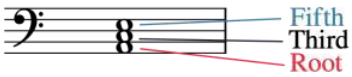
Triads

The three notes of a triad can always be arranged in thirds. **Example 1** shows two triads, each written both **melodically** and **harmonically**. The first triad is on three adjacent spaces, while the second triad is on three adjacent lines. A triad can always be “stacked” so that its notes are either on all lines or all spaces. When a triad is stacked in its most compact form (measures 2 and 4 of **Example 1**), it looks like a snowperson (see **Example 2**). Just as a snowperson consists of a bottom, middle, and head, a triad consists of lowest, middle, and upper notes.



Example 1. *Two triads, shown melodically and harmonically.*

Example 2. *A snowperson.*



Example 3. *A triad with the root, third, and fifth labeled.*

Colloquially, when a triad is stacked in this fashion, we might call this "snowperson form," but the official term is **root position**; this is explored more in the chapter titled Inversion and Figured Bass. As **Example 3** shows, the lowest note of a triad is called the root, the middle note is called the third (a generic third above the root), and the highest note is called the fifth (a generic fifth above the root).

Triadic Qualities and Listening to Triads

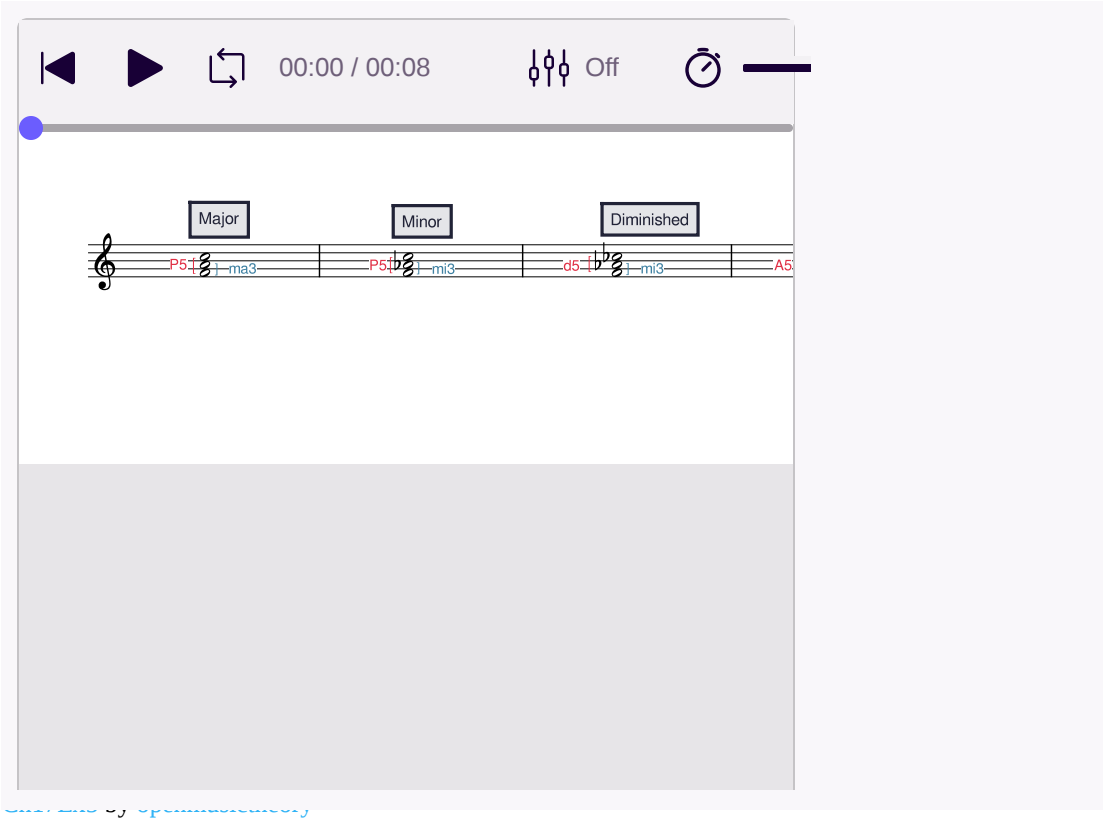
There are four qualities of triad—major, minor, diminished, and augmented—which are determined by the quality of the intervals from the root to the third and the root to the fifth. These qualities are labeled in **Example 4**: triad qualities are shown above the

staff, the quality of the fifth to the root is given in red to the left of the triad, and the quality of the third is given in blue to the right of the triad. Augmented triads are shown last because the other three types are more common in most classical and popular music.

Note that triads are named for certain important intervals they contain:

- Major and minor triads are named for the quality of their third. (Both have perfect fifths.)
- Diminished and augmented triads are named for the quality of their fifth:
  - A diminished triad's fifth is diminished. (Its third is minor.)
  - An augmented triad's fifth is augmented. (Its third is major.)

Listen carefully to the different qualities of triad in **Example 4**. It is common to pair expressive qualities with triads when learning what they sound like. You might think of major triads as sounding "happy," minor triads as "sad," diminished triads as "scary," and augmented triads as having a "fantasy" or "mystical" sound.



Example 4. *Different qualities of triads.*

Chord Symbols

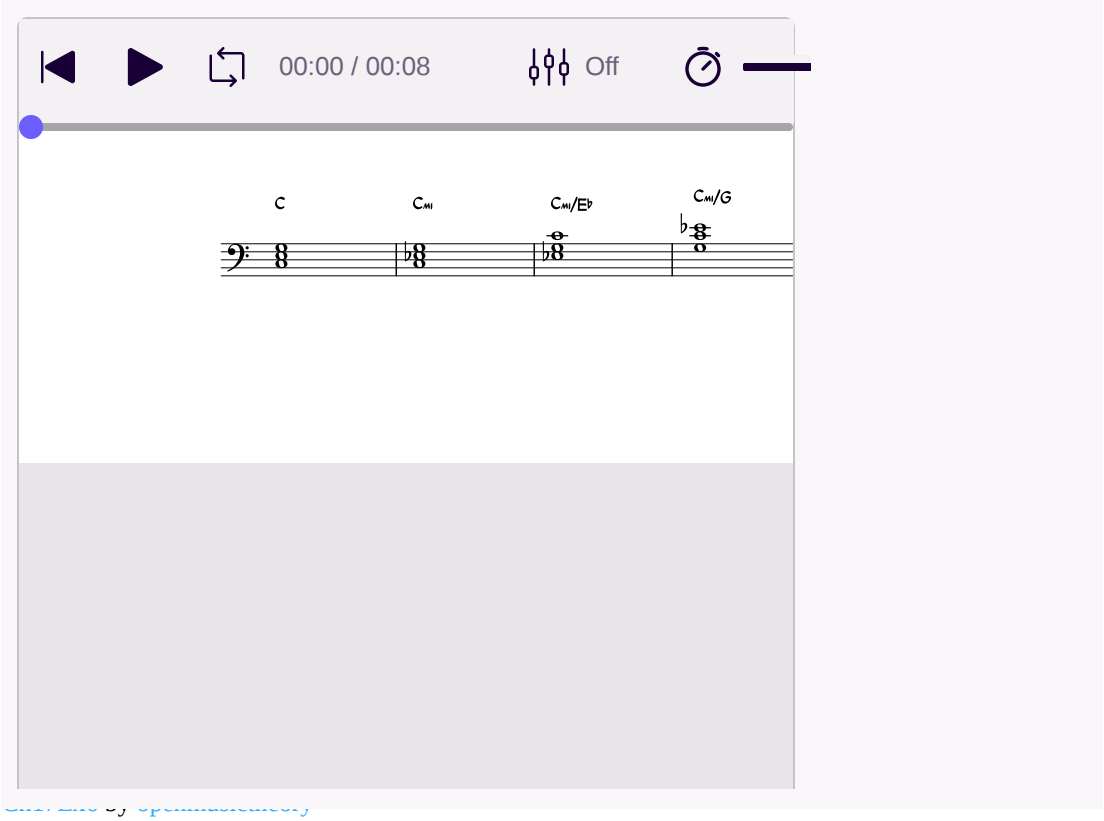
Chord symbols for triads include the letter name of the root and an indication of the triad's quality, and sometimes the pitch class of the bass voice (meaning the lowest note in the chord, not any particular instrument or voice type).

A chord symbol begins with a capital letter (and, if necessary, an accidental) denoting the root of the chord. That letter is followed by information about a chord's quality. *Open Music Theory* will use the following abbreviations.[1]

- Major triad: no quality symbol is added
- Minor triad: lowercase "mi"
- Diminished triad: superscript circle (^{o})
- Augmented triad: plus sign (+)

For example, the chord symbols C, Cmi, C^{o}, and C+ mean a C major triad, C minor triad, C diminished triad, and C augmented triad, respectively. If the root of the chord has an accidental, include it: for example, B♭mi is the chord symbol for a B♭ minor triad, and F♯^{o} is the chord symbol for an F♯ diminished triad.

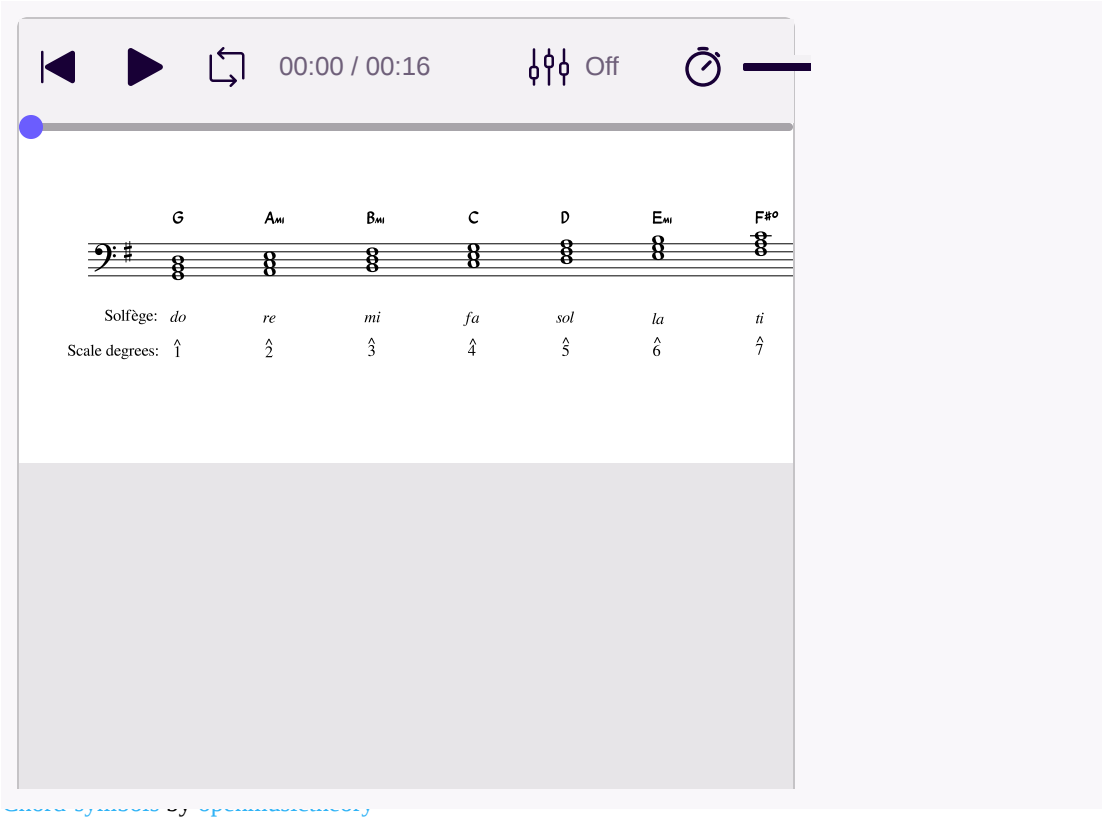
Finally, if a pitch class other than the chord root is the lowest note in the chord, a slash is added, followed by a capital letter denoting the pitch class in the **bass**. This topic will be explored more in the chapter titled Inversion and Figured Bass. **Example 5** first shows C major and C minor triads with their chord symbols (C and Cmi). It then shows how the chord symbol for the C minor triad changes when a note other than C is on the bottom: when E♭ is the lowest note, the chord symbol is Cmi/E♭, and when G is the lowest note, the symbol is Cmi/G.



Example 5. *Four triads are shown with chord symbols.*

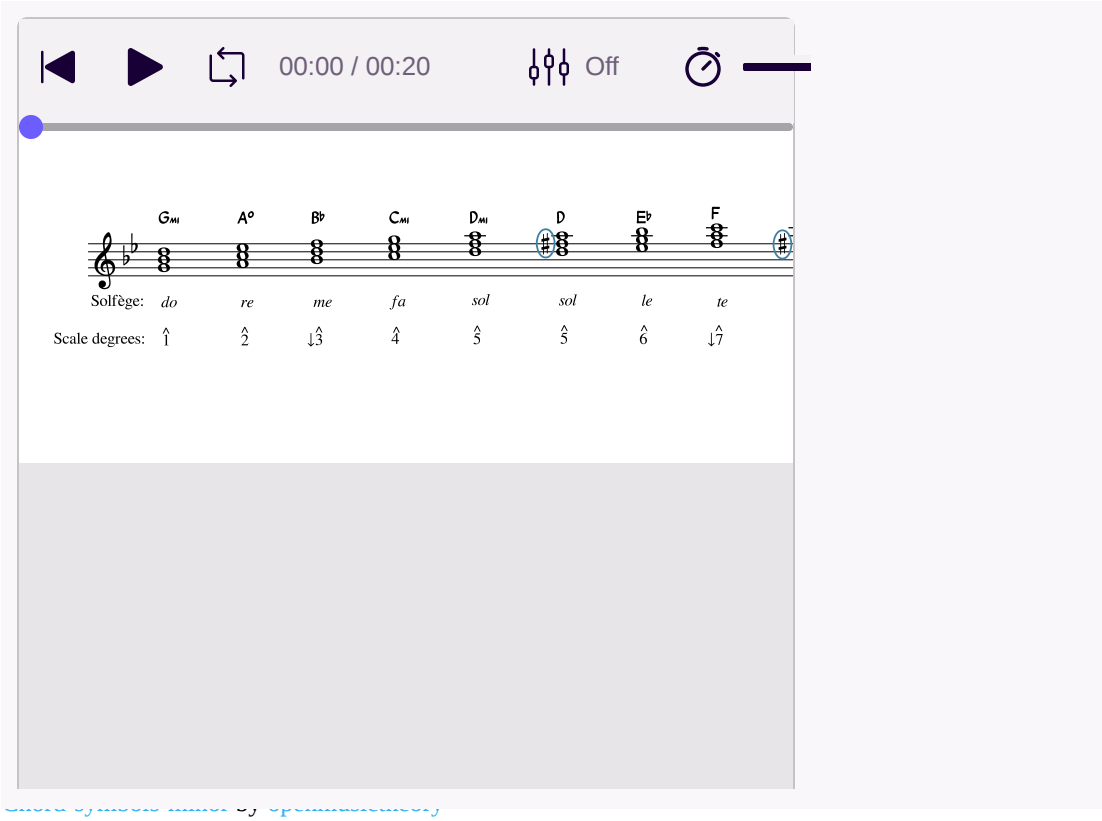
Triad Qualities in Major and Minor

Any note of the major scale can be the root of a triad. As you can see in **Example 6**, which is in the key of G major, triads built on *do*, *fa*, and *sol* (^1, ^4,(1^, 4^, and ^5)5^) in major keys are major, shown with the capital letter of the triad's root. Triads built on *re*, *mi*, and *la* (^2, ^3,(2^, 3^, and ^6)6^) are minor, shown with a lowercase "mi" after the capital letter of the root. Triads built on *ti* (^7)(7^) are diminished; this is shown with a superscript "º" (which you might know as the degree symbol). These triadic qualities do not change in different keys; in other words, the quality of a triad built on *do* (^1)(1^) will always be major in any major key.



Example 6. *Qualities of triads in major keys.*

Example 7, in the key of G minor, shows the pattern of triad quality for minor scales. Note that this example contains two triads built on *sol* (^5)(5^) and two built on *te*/*ti* (↓^7(↓7^/^7)7^)—one without the raised leading tone ("natural minor") and one with the raised leading tone ("harmonic minor"). As you can see in **Example 7**, triads built on *do*, *fa*, and *sol* (^1, ^4,(1^, 4^, and ^5)5^) (without the raised leading tone) are minor (shown with the lowercase "mi"). Triads built on *me*, *le*, and *te* (↓^3,↓^6,(↓3^,↓6^, and ↓^7)↓7^) (without the raised leading tone) are major. A triad built on *sol* (^5)(5^) with the raised leading tone is also major. Triads built on *re* and *ti* (^2(2^ and ^7)7^) (with the raised leading tone) are diminished (shown with the superscript degree symbol).



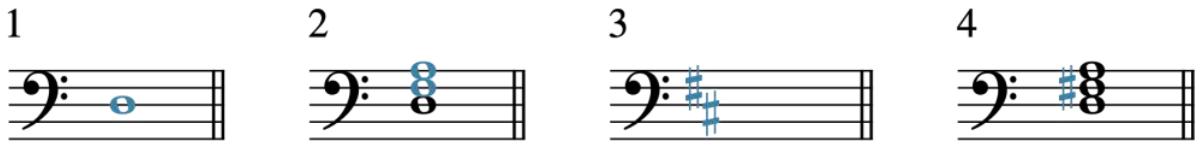
Example 7. Qualities of triads built on the minor scale.

Spelling Triads

To build a triad from a chord symbol, you need to be aware of the triad's **root** and **quality**. Complete the following steps:

1. Draw the root on the staff.
2. Draw notes a third and fifth above the root (i.e., draw a snowperson).
3. Think of (or write down) the major key signature of the triad's root.
4. To spell a major triad, write any accidentals from the key signature that apply to the notes of the triad.
5. For a minor, diminished, or augmented triad, add additional accidentals to alter the chord's third and/or fifth when appropriate.

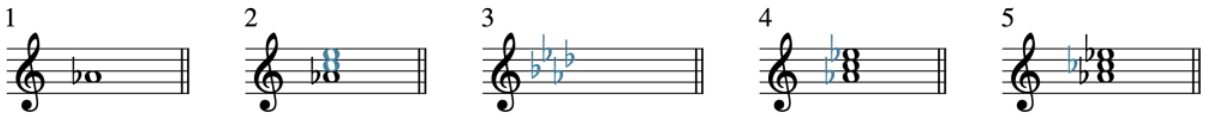
Example 8 shows this process for a D major triad:



Example 8. Drawing a D major triad in four steps.

1. The note D, the chord's root, is drawn on the staff.
2. A snowperson is drawn—an F and A, the notes a generic third and a fifth above the D.
3. The key signature of D major has been recalled. D major has two sharps, F♯ and C♯.
4. A sharp (♯) has been added to the left of the F, because F♯ is in the key signature of D major. No C♯ was necessary because there is no C in the chord.

Let's complete this process for an A♭ minor triad (A♭mi), as seen in **Example 9**.



Example 9. *Drawing an A♭ minor triad in five steps.*

1. The note A♭ is written because it is the root of the triad.
2. A snowperson is drawn; in other words, the notes C and E are added because they are a generic third and fifth, respectively, above A♭.
3. The key signature of A♭ major is recalled. A♭ major has four flats: B♭, E♭, A♭, and D♭.
4. E♭ is added, because it is in the key signature of A♭ major. B♭ and D♭ are not needed, because those notes aren't in an A♭ triad. Now we have successfully spelled an A♭ major triad (A♭, C, and E♭).
5. Minor triads contain a minor third, which is one half step smaller than a major third. Therefore, our final step is to lower the chord's third (the C) by a half step (to a C♭). Now we have an A♭ minor triad (A♭, C♭, and E♭).

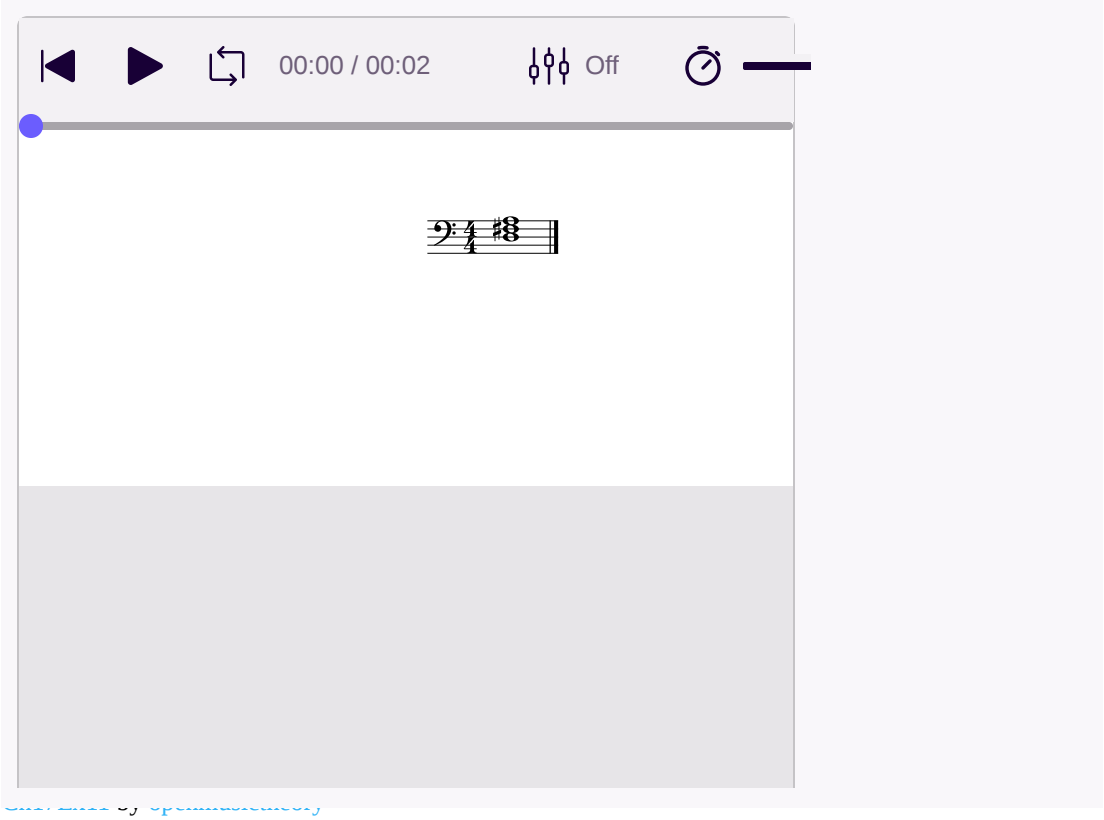
Don't forget that diminished triads have a minor third and a diminished fifth, meaning you have to lower both the third and the fifth by a half step from a major triad. An augmented triad has a major third and an augmented fifth, so its fifth must be raised by a half step from a major triad.

Identifying Triads, Doubling, and Spacing

Triads are identified according to their root, quality, and inversion; inversion is discussed in the Inversion and Figured Bass chapter, so we will focus on root and quality for now. You can identify triads in three steps:

1. Identify and write its root.
2. Imagine the major key signature of its root.
3. Identify and write its quality.

Example 10 shows a triad for the process of identification.

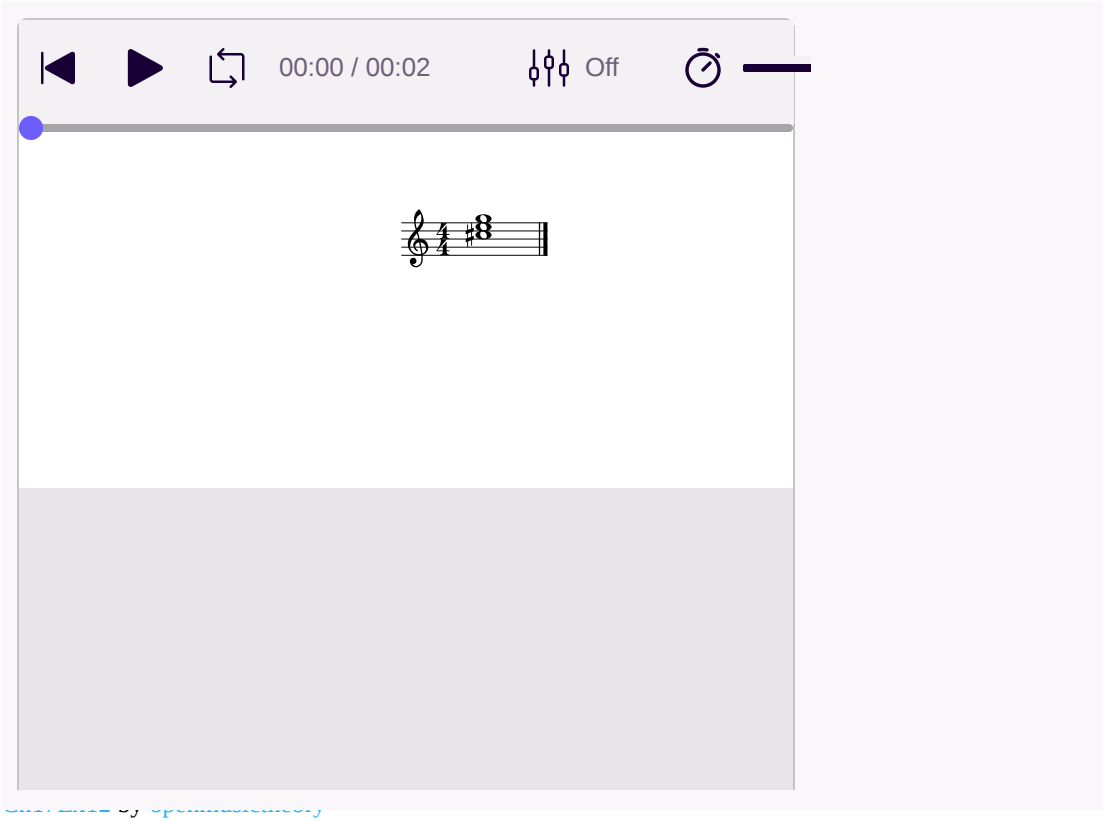


Example 10. *A triad for identification.*

To identify this triad:

1. This triad is written in its most compact form, so the root is the lowest note, D.
2. The key of D major has two sharps, F♯ and C♯; we can use this information to identify the quality of the triad.
3. In this triad, the F is sharp, matching the major key signature. Therefore, we can correctly identify this as a D major triad.

Let's apply the same steps to the triad in **Example 11**:



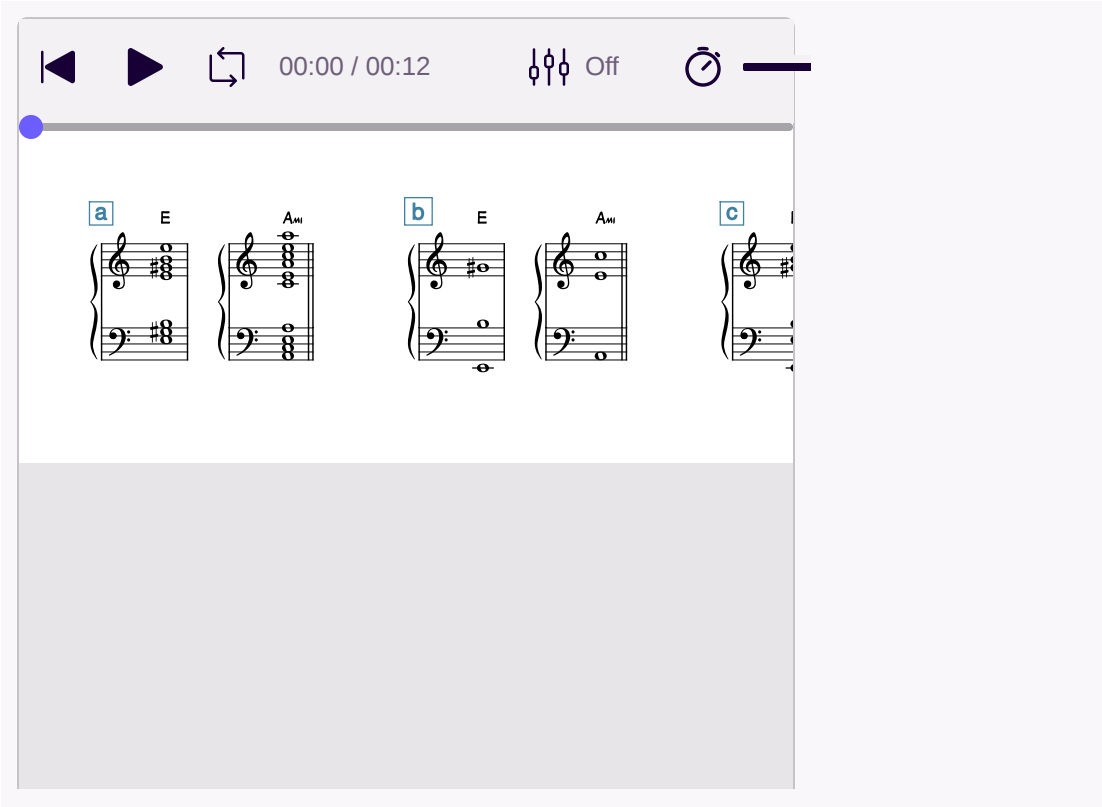
Example 11. *A second triad for identification.*

To identify this triad:

1. First, we identify and write its root, which is C♯.
2. Next, we can identify and write its quality. We imagine the key signature of C♯ major, which has seven sharps (every note is sharp).
3. Therefore, E and G would be sharp in the key of C♯ major, but we see that they are both natural in **Example 11**. Because both the third and the fifth have been lowered by a half step, this triad is diminished. We can now correctly identify this triad as a C♯^{o} triad.

If the bottom note of a triad has an imaginary key signature (because there is a double accidental that applies to it), use enharmonic equivalence to respell the triad. The process for this will be the same as that outlined in the last section of Intervals.

Because of the principle of **octave equivalence**, the **doubling** or **spacing** of notes does not affect a triad's identification. **Example 12** shows several different triads and their chord symbols. As you can see, the identification of these triads is the same, regardless of octave doublings (**Example 12a**) or the use of **open spacing** with wide intervals (**Example 12b**). Doublings and open spacing can be combined, as seen in **Example 12c**. In order to identify triads with doublings and open spacing, you need to either imagine or write the notes as a triad in **closed spacing** without any doublings.



Example 12. Doublings do not affect chord symbols.

Online Resources

- Introduction to Chords (musictheory.net)
- Triad Introduction (Robert Hutchinson)
- What is a Triad? (YouTube)
- Building Triads (YouTube)
- Constructing Triads (Columbia)
- Lead-sheet Symbols (Robert Hutchinson)
- Triad Identification Practice Tool (teoria)
- Chord Ear Training (musictheory.net)
- Triad Ear Training (Tone Dear)
- Triad Ear Training (teoria)

Assignments from the Internet

A. Triad Identification (.pdf, .pdf, .pdf, .pdf, .pdf, .pdf, .pdf, .pdf)
B. Triad Construction (.pdf), pp. 2, 4, 6, 7 (.pdf), p. 9 (.pdf)

Assignments

1. Triads Assignment #1 (.pdf, .mcsz)
2. Triads Assignment #2 (.pdf, .mcsz)
3. Triads Assignment #3 (.pdf, .mcsz)

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- d-major © Megan Lavengood is licensed under a CC BY-SA (Attribution ShareAlike) license
- ab-minor © Megan Lavengood is licensed under a CC BY-SA (Attribution ShareAlike) license

1. You may see other abbreviations in other contexts (a more exhaustive list is given in the Chord Symbols chapter). ↵

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CHAPTER OVERVIEW

6: Unit 6- Seventh Chords

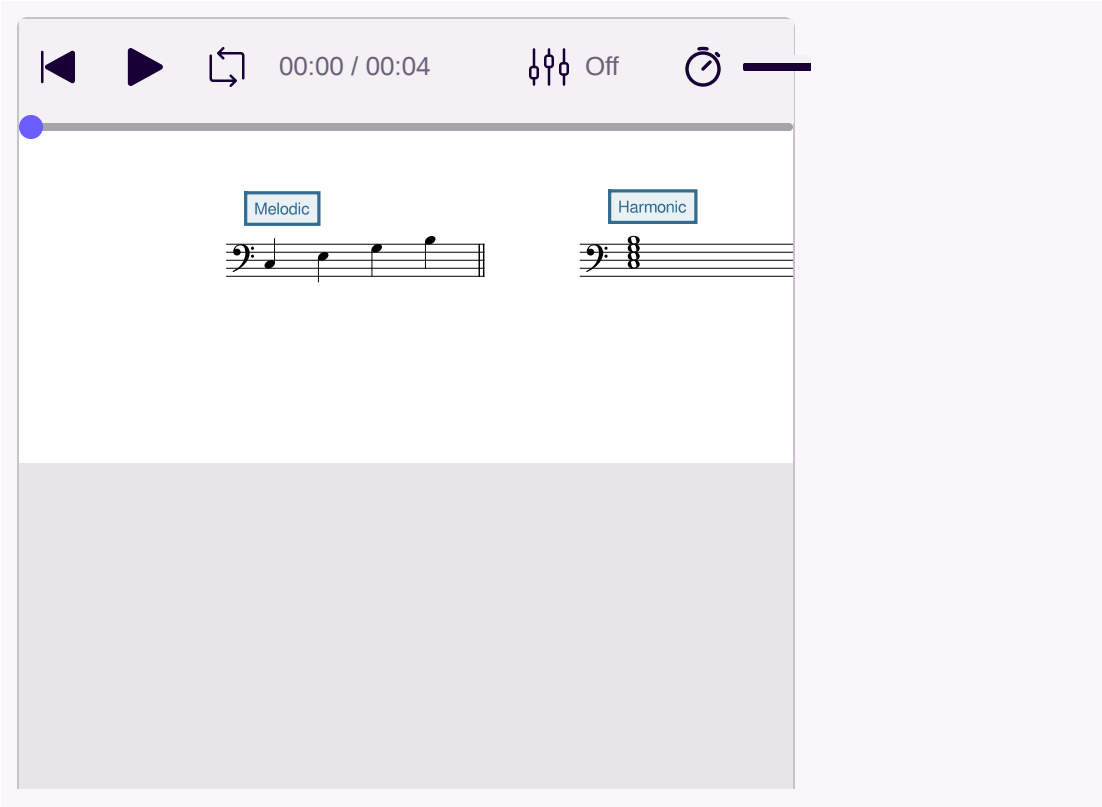
Key Takeaway

- A **seventh chord** is a four-note chord whose notes can be arranged in thirds. A seventh chord can always be “stacked” so that its notes are either on all lines or all spaces.
- When a seventh chord is stacked in thirds, the lowest note is called the **root**, the lower middle note is called the **third**, the upper middle note is called the **fifth**, and the highest note is called the **seventh**, which is sometimes called the “chordal” seventh to distinguish it from the seventh scale degree.
- There are five common qualities of seventh chord. These qualities are the **major-major seventh chord**, **major-minor seventh chord**, **minor-minor seventh chord**, **half-diminished seventh chord**, and **fully diminished seventh chord**.
- There is another common way of naming seventh chords: the major-major seventh chord is also often called the **major seventh chord**, the major-minor seventh chord is also often called the **dominant seventh chord**, the minor-minor seventh chord is also often called the **minor seventh chord**, and the fully diminished seventh chord is also often simply called the **diminished seventh chord**.
- Within major and minor keys, seventh chords have particular qualities that correspond to scale degrees. These are the same in every major and minor key, which makes memorizing them useful.
- Seventh chords are identified by their **root**, **quality** of triad and seventh, and **inversion**.

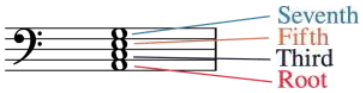
In this chapter, we will focus on **seventh chords**: four-note chords whose notes can be stacked into thirds.

Seventh Chords

Like triads, the notes of a seventh chord can always be arranged in thirds, on adjacent lines or spaces of the staff. If a triad in **closed spacing** looks like a snowperson, then a seventh chord in closed spacing (as in the second measure of **Example 1**) looks like an extra-long snowperson, with a bottom, two middles, and a head.



Example 1. *A seventh chord written melodically and harmonically.*



Example 2. *A seventh chord with the root, third, fifth, and seventh labeled. Click to enlarge.*

Like in a triad, the lowest note of a seventh chord stacked in closed spacing is called the **root**, and the other notes are named for their generic intervals above the root, as shown in **Example 2**: the **third**, the **fifth**, and the **seventh**.

Seventh Chord Qualities and Nomenclature

Example 3 lists the five most common qualities of seventh chord: **major-major**, **major-minor**, **minor-minor**, **half-diminished**, and **fully diminished**. These qualities are determined by two factors:

1. The quality of the triad created by the root, third, and fifth (shown in the second column)
2. The quality of the seventh from the root to the seventh (shown in the third column)

A chord symbol for a seventh chord begins with the letter name of the triad's root followed by an indication of the quality of its triad and seventh. Examples of chord symbols for different seventh chord qualities are given in the last column of **Example 3**.[1]

Seventh chord quality	Triad quality	Seventh (interval) quality	Example chord symbol
Major-major seventh chord (Major seventh chord)	major triad	major seventh	F^{ma7}
Major-minor seventh chord (Dominant seventh chord)	major triad	minor seventh	F^{7}
Minor-minor seventh chord (Minor seventh chord)	minor triad	minor seventh	Fmi^{7}
Half-diminished seventh chord	diminished triad	minor seventh	$F^{\varnothing 7}$

Seventh chord quality	Triad quality	Seventh (interval) quality	Example chord symbol
Fully diminished seventh chord (Diminished seventh chord)	diminished triad	diminished seventh	F^{o7}

Example 3. *Summary of nomenclature for different qualities of seventh chord.*

For the first three qualities of seventh chord, the first word describes the quality of the triad, and the second word describes the quality of the seventh:

- **major-major** seventh chord = **major** triad + **major** seventh
- **major-minor** seventh chord = **major** triad + **minor** seventh
- **minor-minor** seventh chord = **minor** triad + **minor** seventh

The other two qualities are both built on diminished triads but differ in the quality of the seventh:

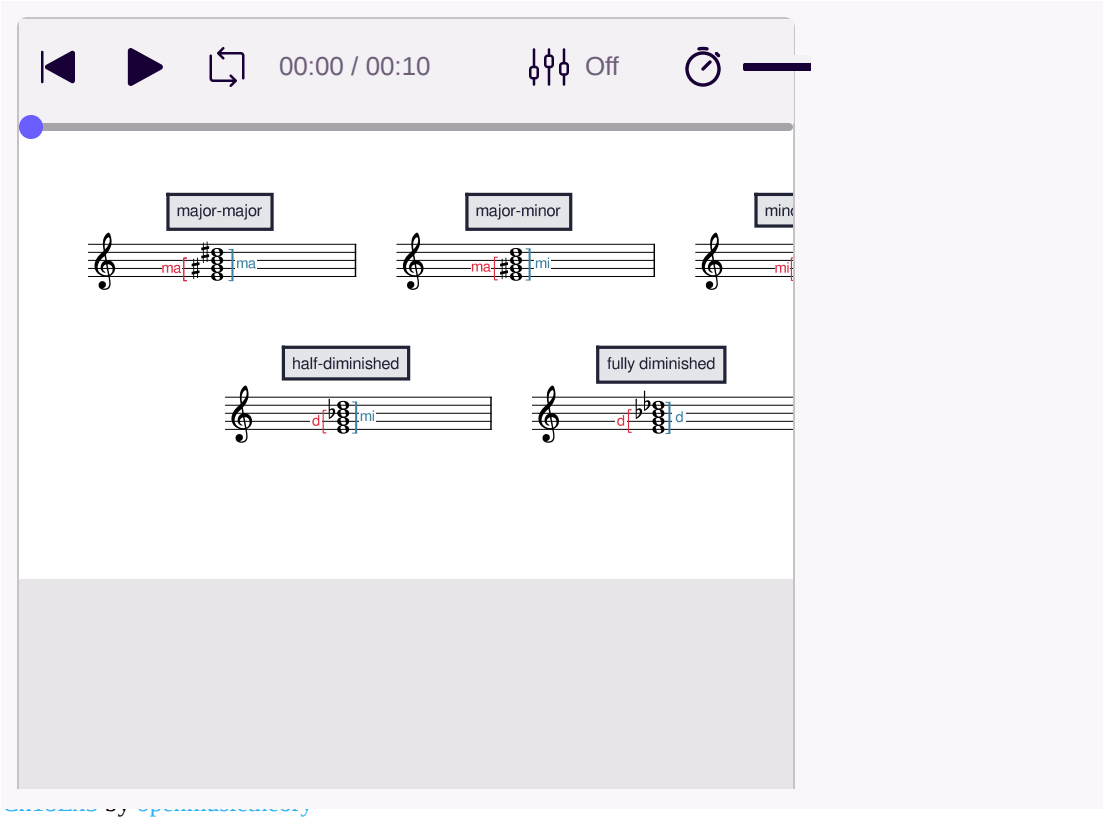
- half-diminished seventh chord (diminished triad, minor seventh)
- fully diminished seventh chord (diminished triad, diminished seventh)

Music theorists often use the names described above, but there is also another common way of naming these chords, given in parentheses in the first column of **Example 3**:

- The major-major seventh chord is also often called the **major seventh chord**.
- The major-minor seventh chord is also often called the **dominant seventh chord**.
- The minor-minor seventh chord is also often called the **minor seventh chord**.
- The fully diminished seventh chord is also often simply called the **diminished seventh chord**.
- The half-diminished seventh chord does not typically have an alternate name.

Your instructor may have you label these chords using one set of terminology or the other, or a mix of both.

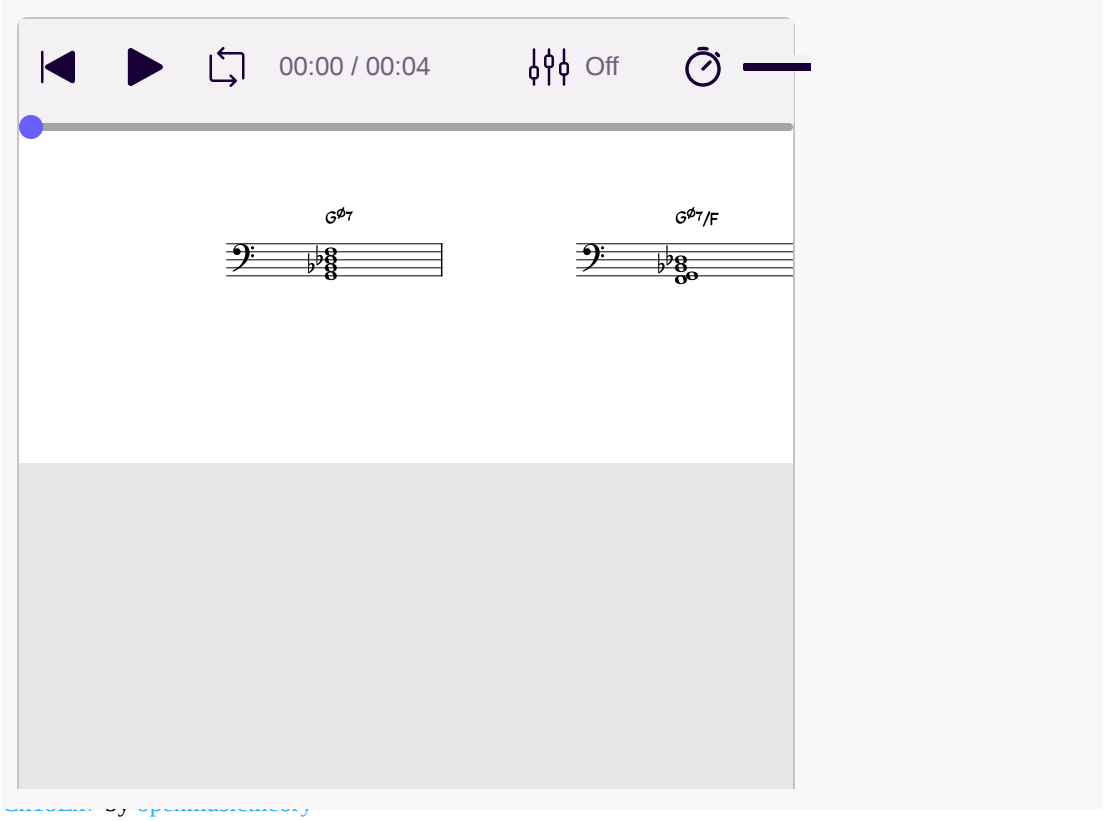
Example 4 summarizes all this information in music notation.



Example 4. *The qualities of sevenths and triads in various seventh chord types.*

Don't forget that when the root of a seventh chord has an accidental, you add that accidental into its name. For example, B♭mi^{7} is the chord symbol for a seventh chord with a B♭ minor triad and a minor seventh. Likewise, a G♯^{ma7} is the chord symbol for a seventh chord with a G♯ major triad and a major seventh.

In chord-symbol notation, if a pitch class other than the chord's root is the lowest note in a seventh chord, then a slash is added, followed by a capital letter denoting the pitch class in the bass (lowest) voice. **Example 5** shows a G half-diminished seventh chord (G$^{\varnothing 7}$). In the first measure, the chord appears in first position; in the second measure, the chord's seventh (F) is in the bass voice, so the chord symbol is written as G$^{\varnothing 7}$/F. This topic will be explored more in the chapter Inversion and Figured Bass.



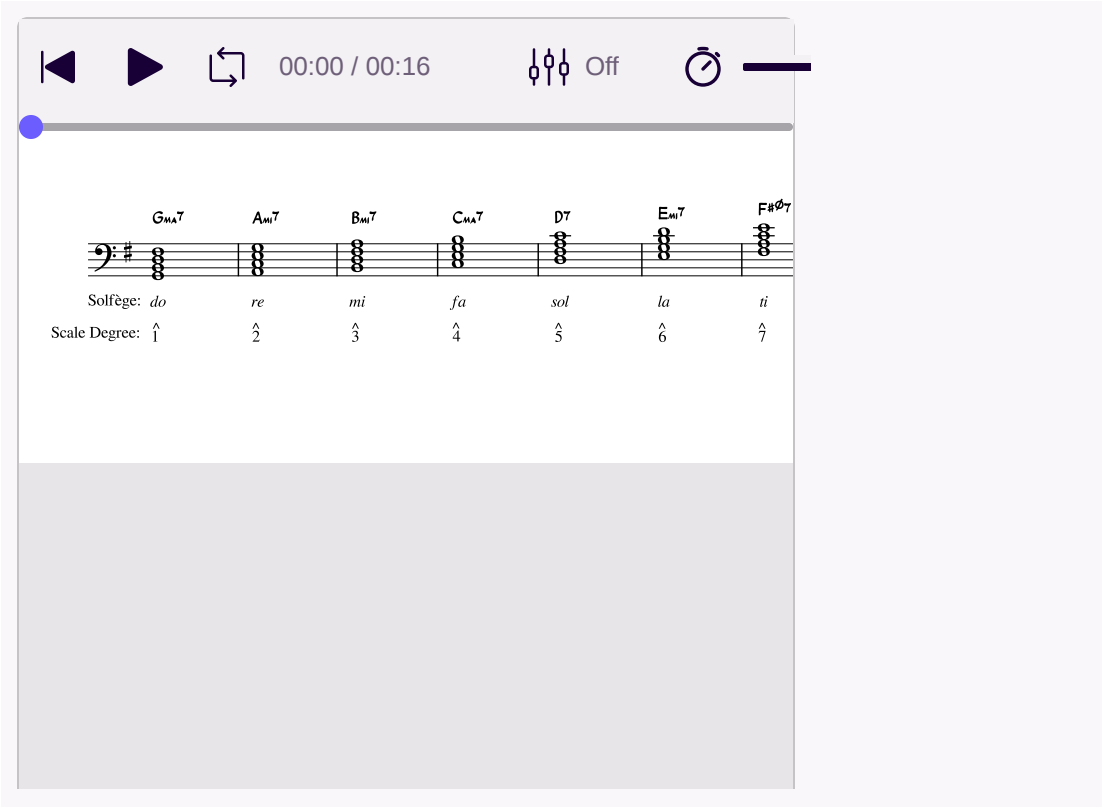
Example 5. *Two seventh chords.*

Listening to Seventh Chords

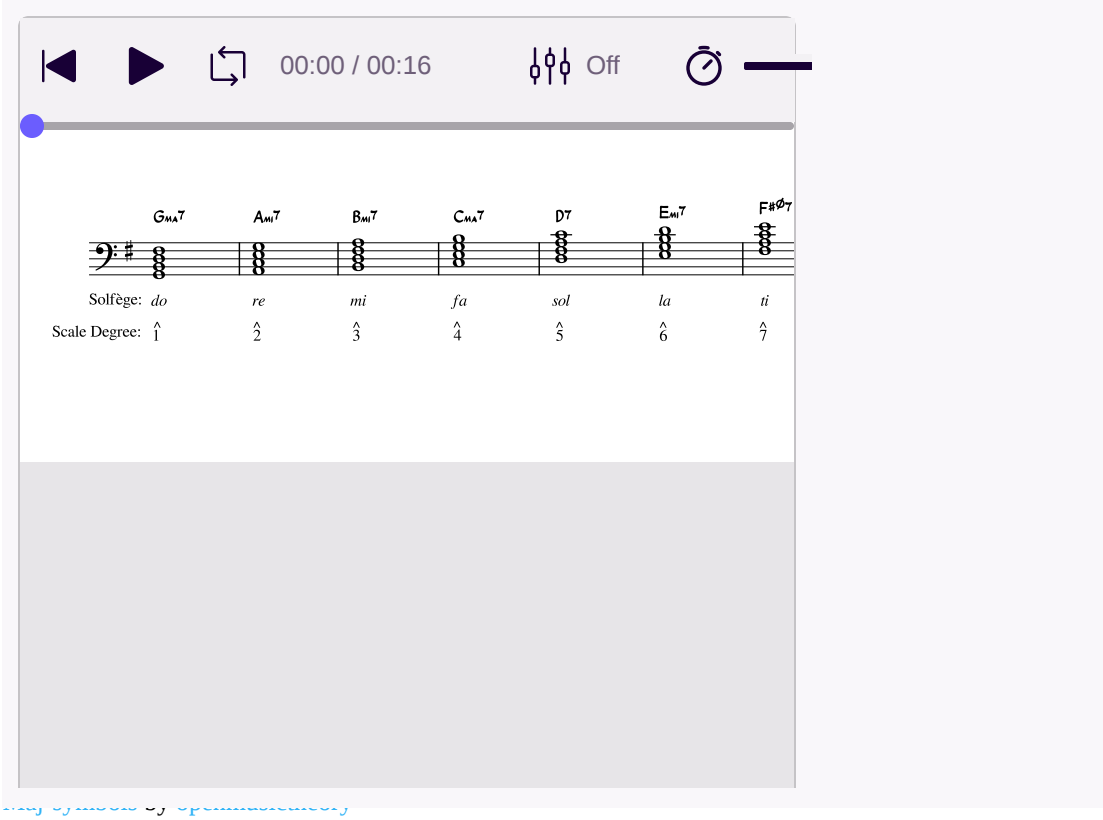
Listen carefully to the different qualities of seventh chord in **Example 4**. It is common to pair expressive qualities with seventh chords when learning what they sound like. You might think of major-major seventh chords as sounding "happy and jazzy," major-minor seventh chords as sounding "unresolved" (like they strongly need to move to another chord), minor-minor seventh chords as "sad and jazzy," half-diminished seventh chords as "scary and jazzy," and fully diminished seventh chords as "very scary."

Seventh Chord Qualities in Major and Minor

Seventh chords can be built on any note of the major scale. As you can see in **Example 6**, which is in the key of G major, seventh chords built on *do* (^1)(1^) and *fa* (^4)(4^) have a major triad and a major seventh, while seventh chords built on *sol* (^5)(5^) have a a major triad and a minor seventh (a dominant seventh chord). Seventh chords built on *re*, *mi*, and *la* (^2, ^3,(2^, 3^, and ^6)6^) have a minor triad and a minor seventh, while seventh chords built on *ti* (^7)(7^) are half-diminished—they have a diminished triad and a minor seventh. These seventh chord qualities do not change in different keys; consequently, memorizing these qualities can be very useful.



Example 6. Qualities of seventh chords in major keys.



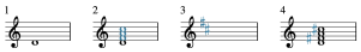
Example 8. Qualities of seventh chords in minor keys.

Spelling Seventh Chords

To build a seventh chord from a chord symbol, you need to be aware of its root and quality—inversion is discussed in the next chapter, titled Inversion and Figured Bass. The steps for spelling a seventh chord are similar to the steps for drawing a triad. Let's start with spelling a major-major seventh chord:

1. Draw the root on the staff.
2. Draw notes a third, fifth, and seventh above the root (i.e., draw an "extra-long" snowperson).
3. Think of (or write down) the major key signature of the triad's root.
4. Write any accidentals from the key signature that apply to the notes in the chord, creating a major triad and a major seventh.

For any other quality of seventh chord, add additional accidentals to alter the chord's third, fifth, and/or seventh when appropriate.

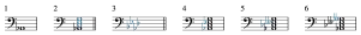


Example 8. *Spelling a D major-major seventh chord in four steps. Click to enlarge.*

Example 8 shows this process for a D major-major seventh chord (D^{ma7}):

1. The note D, the chord's root, is drawn on the staff.
2. An extra-long snowperson is drawn—an F, A, and C, the notes a generic third, fifth, and seventh above the D.
3. The key signature of D major has been recalled. D major has two sharps, F♯ and C♯.
4. Sharps (♯) have been added to the left of the F and the C, because F♯ and C♯ are in the key signature of D major.

The quality of the next chord will require us to write additional accidentals, so the process has a couple more steps. **Example 9** shows the process for an A♭ fully diminished seventh chord ($A♭^{o7}$):



Example 9. *Spelling an A♭ fully diminished seventh chord in six steps. Click to enlarge.*

1. The note A♭ is written because it is the root of the triad.
2. An extra-long snowperson is drawn: C, E, and G are added because they are a generic third, fifth, and seventh, respectively, above A♭.
3. The key signature of A♭ major is recalled. A♭ major has four flats: B♭, E♭, A♭, and D♭.
4. E♭ is added, because it is in the key signature of A♭ major.
5. We have now followed the process to spell a major-major seventh chord, but we want a fully diminished seventh chord, which means adding accidentals that are not in the key signature of A♭ major:
    1. C and E♭ are lowered by a half step to C♭ and E𝄫 to change the triad from major to diminished.
    2. To change the chord's seventh from major to diminished, it needs to be lowered by two half steps, from G to G𝄫.

Following these steps is a reliable way for beginners to spell seventh chords, but it's a time-consuming process. If you practice playing all of the qualities of seventh chords on an instrument until you are fluent in them, your knowledge of these notes will become more automatic without using this process.

Identifying Seventh Chords, Doubling, and Spacing

Like triads, seventh chords are also identified according to their **root**, **quality**, and **inversion**; inversion is discussed in the Inversion and Figured Bass chapter, so the examples here will be in **root position**.

1. Identify and write its root.
2. Imagine the major key signature of its root.
3. Identify and write its quality of its triad.
4. Identify and write its quality of its seventh.

Example 10 shows a seventh chord in root position for the process of identification.

https://musescore.com/static/musesco...che=1661014238

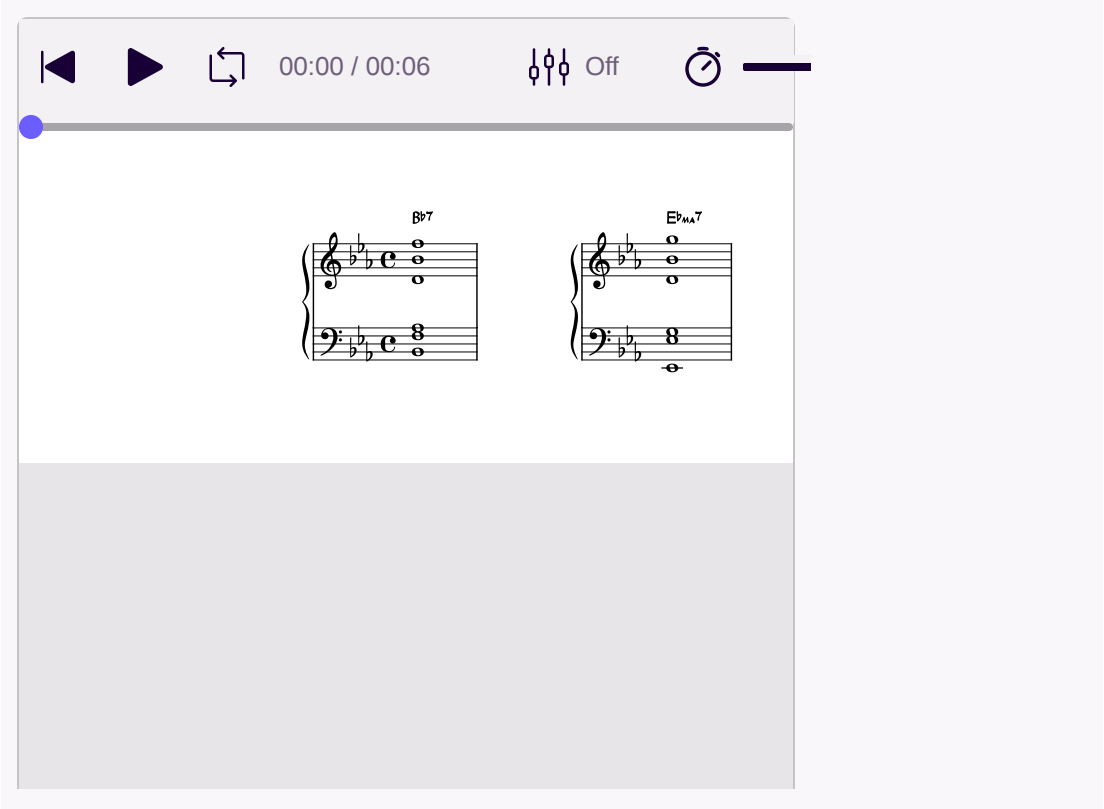
Example 10. *A seventh chord in root position for identification.*

To identify this seventh chord:

1. Because the chord is in root position, the root is the lowest note, C♯.
2. The key of C♯ major has seven sharps (every note is sharp). E and G would be sharp in the key of C♯ major, but we see that both of those notes are natural instead—lowered by a half step—making the triad diminished.
3. The chord's seventh, B, would also be sharp in C♯ major, but it is natural here. When a major seventh is made a half step smaller, it becomes a minor seventh.
4. A diminished triad and a minor seventh form a half-diminished seventh chord; therefore, this is a C♯ half-diminished seventh chord ($C\sharp^{\varnothing 7}$).

If the bottom note of a seventh chord has an imaginary key signature (because there is a double accidental that applies to it), use enharmonic equivalence to respell the seventh chord, following the process outlined in the last section of the Intervals chapter.

Like with triads, a seventh chord's identification is not affected by the **doubling** of notes or **open spacing** of notes (even across multiple clefs). **Example 11** shows two different seventh chords in [pb_glossary open spacing with doublings. Simply imagine or write the notes of seventh chords in closed spacing without any doublings to identify these chords, as we did previously.



Example 11. *Two seventh chords with doublings in open spacing.*

Online Resources

- Seventh Chords (musictheory.net)
- Understanding Seventh Chords in Music (Hello Music Theory)
- Introduction to Seventh Chords (Robert Hutchinson)
- Seventh Chords (Kaitlin Bove)
- Seventh Chords (Music Theory Academy)
- Seventh Chords (Carleton College)
- Seventh Chords For Dummies (YouTube)
- Seventh Chords – Music Theory Crash Course (YouTube)
- Seventh Chord Ear Training (teoria)
- Chord Ear Training (musictheory.net)
- Chord Ear Training (Tone Savvy)

Assignments from the Internet

A. Seventh Chord Construction (.pdf, .pdf), p. 1 .pdf)
B. Constructing and Identifying Seventh Chords (.pdf)
C. Identifying Root Position Diatonic Seventh Chords, Major, p.1 (.pdf)
D. Identifying Root Position Diatonic Seventh Chords, Minor, p.1 (.pdf)

Assignments

1. Seventh Chords Assignment #1 (.pdf, .mcsz)
2. Seventh Chords Assignment #2 (.pdf, .mcsz)
3. Seventh Chords Assignment #3 (.pdf, .mcsz)

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- abdim7 © Megan Lavengood is licensed under a CC BY-NC-SA (Attribution NonCommercial ShareAlike) license

Footnotes

1. These chord symbols reflect those used in *Open Music Theory*, but you may come across others in your studies. See Chord Symbols for a more thorough explanation of these variations. ↵

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CHAPTER OVERVIEW

7: Unit 7- Basics of Sight-singing and Dictation

Key Takeaways

- **Sight-singing** means to sing at sight, having never before heard or seen what you are singing. **Sight-counting** is counting a rhythm you have never before heard or seen.
- Always practice sight-singing with the rhythmic and melodic **solmization** systems your instructor taught you. The more you practice, the easier solmization will be!
- Practice sight-singing and sight-counting while conducting when possible. If you're having trouble, practice at a slower tempo.
- **Dictation** involves translating rhythms, melodies, chord progressions, or other aural sounds that you've never before seen, played, or sung into staff notation.
- Strategies for rhythmic dictation include **dot grids**, **slash notation**, and **protonotation**. Conducting and/or tapping while taking dictation can also help.
- Strategies for melodic dictation include **contour lines**, writing down solmization syllables, and **protonotation**. Conducting and/or tapping while taking dictation can also help.

Regardless of whether you are a vocalist or instrumentalist (or both!), you will likely study **sight-singing**. Sight-singing means to sing at sight, having never before heard or seen what you are singing. A related skill is **sight-counting**, which is counting a rhythm you have never before heard or seen. There are many strategies that will help you learn how to sight-sing and sight-count.

Strategies for Sight-Singing and Sight-Counting

If you are learning to sight-sing and sight-count in a classroom, then you are likely going to practice these skills sitting down. When you sight-sing or sight-count, it is important to make sure you have good posture. You will want to sit up straight, at the edge of your chair, with your thighs parallel to the ground. Breathe from your diaphragm (not your chest!) and articulate your singing and counting syllables as clearly as possible.

Example 1 demonstrates proper singing posture while sitting down:

Example 1. *Proper singing posture sitting down.*

When sight-counting, it is helpful to use a rhythmic **solmization** system. *Open Music Theory* prioritizes American standard counting, but there are many other great counting systems available. Here are some other strategies for sight-counting:

- Do not write your counts on your music. This will save you time and will help you to learn to count at sight.
- When you first look at a rhythm to sight-count, note the time signature. How many beats are in each measure, and what note value gets the beat?
- Conduct while you sight-count. This will help you to keep a steady tempo and to remember which beat you are counting.
- If you are not conducting, try tapping a steady beat while sight-counting. This will help you to keep a steady tempo.
- If you are still having trouble keeping a steady tempo, practice with a metronome app.
- If you're having trouble with a rhythm or with solmization syllables, practice at a slower tempo or break the rhythm down into smaller chunks.

When sight-singing, it is extremely helpful to use a melodic **solmization** system, such as **scale degrees** or **solfège** (see both Major Scales, Scale Degrees, and Key Signatures and Minor Scales, Scale Degrees, and Key Signatures.) Both systems are valid; what is important is that you practice consistently, as solmization will become easier the more you practice it. Here are some other strategies for sight-singing:

- Do not write your solfège or scale degrees on your music. This will save you time and will help you to learn to sing at sight.
- When you first look at a melody to sight-sing, note the clef, time signature, and key signature. What is the clef? How many beats are in each measure, and what note value gets the beat? What key is the work in?
- Notice the contour of the melody you are about to sight-sing. Singing the correct direction (up, down, or the same note) is half the battle!
- Conduct while you sight-sing. This will help you to keep a steady tempo and to remember which beat your singing.
- If you are not conducting, try tapping a steady beat while sight-singing. This will help you to keep a steady tempo.
- If you are having trouble sight-singing with a steady tempo, practice with a metronome app.
- If you're having trouble with a melody, practice at a slower tempo or break the melody down into smaller chunks.
- If you're having trouble with rhythm, take the pitches out and just practice the rhythm.
- If you're having trouble with pitches, take the rhythm out and sing the pitches on a singular rhythm.

Learning to sight-sing and to sight-count is rewarding, but it takes many years to master these skills. This is why many undergraduate music curricula have four full classes dedicated to these skills (often called "Aural Skills"). Remember to be patient with yourself and to meet with your instructor for help early on if you are struggling.

Strategies for Dictation

Dictation is another important topic that musicians study. Your instructor will likely play rhythms, melodies, chord progressions, or other aural sounds that you've never before seen, played, or sung. You will then translate those aural sounds into staff notation. There are many strategies that will help you with dictation.

Rhythmic Dictation

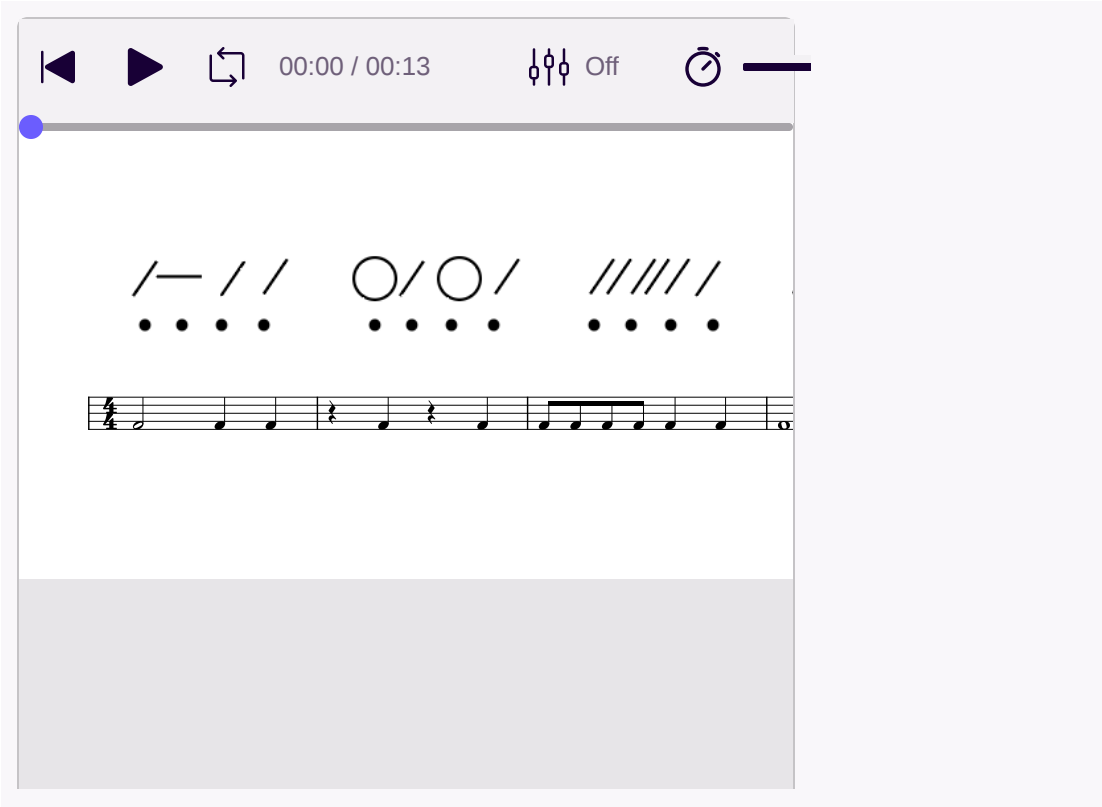
The Basics of Sight-Singing and Dictation – OPEN MUSIC THEORY (pressbooks.pub)

***Example 2**. A rhythm for dictation.*

Listen to **Example 2**, which is a recording of a rhythm for dictation. One strategy for taking rhythmic dictation is to construct a **dot grid**. A dot grid is a series of dots that represent beats and measures. **Example 3** shows a dot grid for four measures in common time:

***Example 3.** A dot grid for four measures in common time.*

Once a dot grid is constructed, you can place slashes to indicate where you hear articulations, dashes (horizontal lines) to indicate sustained notes, and circles to indicate rests. This is called **slash notation**. Next, you will want to translate your slash notation to staff notation. **Example 4** shows slash notation, followed by staff notation.



Slash staff by openmusictheory

Example 4. *Slash notation and staff notation of* ***Example 2****.*

It is also helpful to conduct or tap while taking rhythmic dictation. Tapping allows you to hear if a note happens on a beat or not—or if there is a rest on a beat. Conducting can help you to identify which beats have articulations, sustains, and rests.

Melodic Dictation

The Basics of Sight-Singing and Dictation – OPEN MUSIC THEORY (pressbooks.pub)

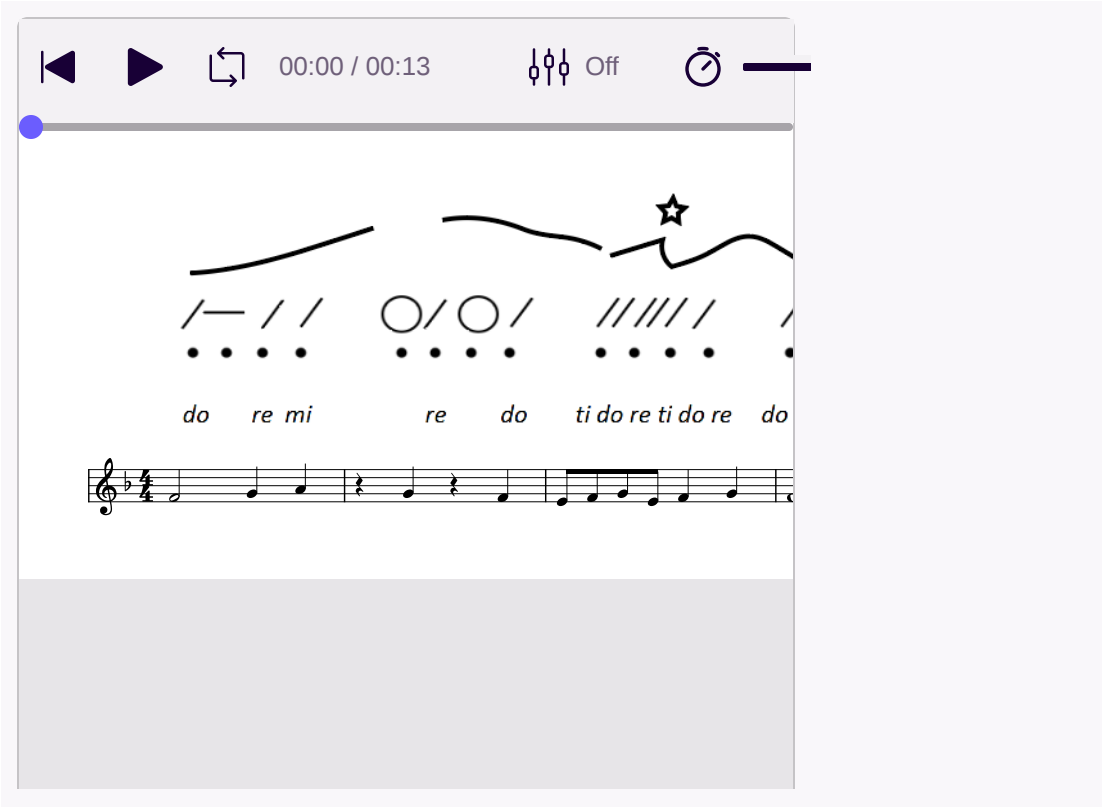
Example 4*. A melody with the same rhythm as* ***Example 2****.*

Listen to **Example 4**, which adds pitches to the rhythmic dictation from **Example 2** above. The first step for taking melodic dictation is to write down the melody's rhythm (see the previous section on rhythmic dictation), then add pitch to your rhythm. There are several strategies for this. The first strategy is to use **contour lines**, which indicate whether a note moves up, down, or stays the same (**Example 5**). You can also use stars (or another symbol) to indicate where you hear a leap. Another strategy is to write down the syllables you hear using your melodic **solmization** system (**Example 6**).

Example 5. *Contour lines have been added to the slash notation.*

Example 6. *Solfège has been added to the slash notation.*

The next step is to translate your contour lines and solmization syllables into staff notation (**Example 7**).



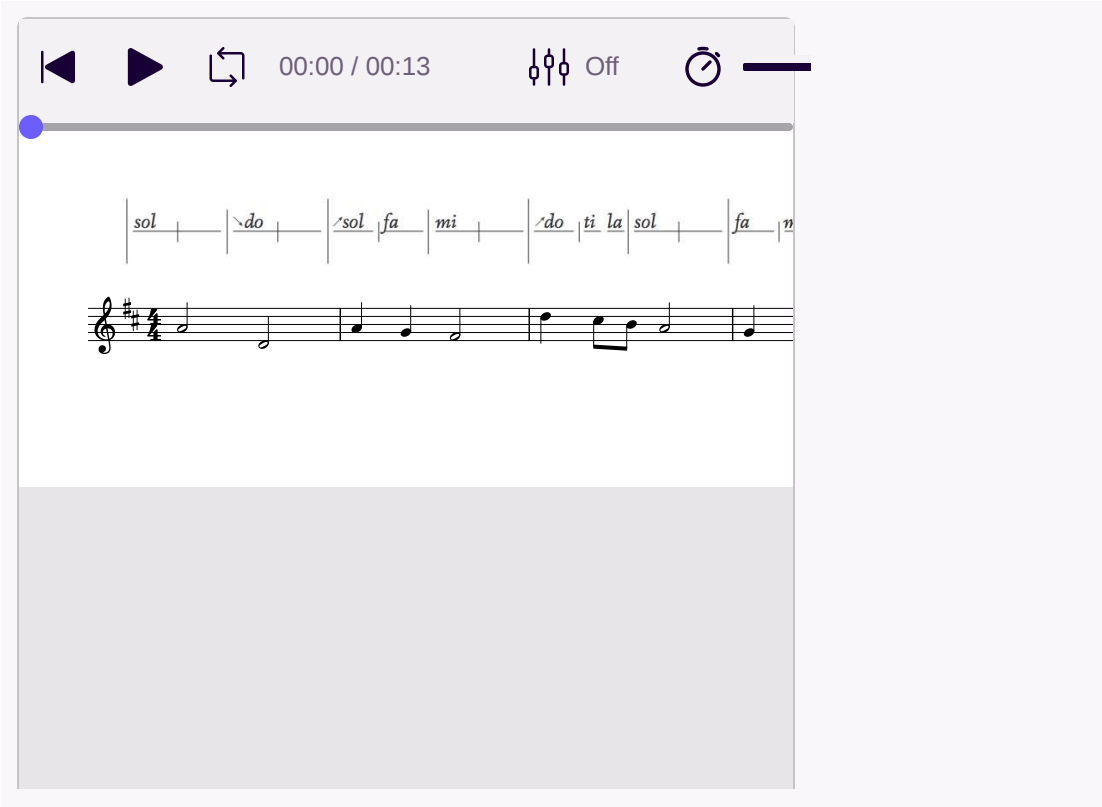
College staff by openmusictheory

Example 7. Examples 5–6 *in staff notation.*

It is also helpful to conduct or tap while taking melodic dictation, for the same reasons that it is helpful for rhythmic dictation.

Protonotation

Protonotation is a basic system of musical notation that is drawn from the book *Manual for Ear Training and Sight Singing* by Gary Karpinski (2007, 1–28). This system can also be used to take rhythmic and melodic dictation, and many find it very helpful. **Example 8** shows a melody in protonotation and in staff notation:



Example 8. *A melody in protonotation and staff notation.*

Protonotation does not contain information about beat duration or key. It only represents basic pitch and rhythmic elements (discussed further below).

Elements of Protonotation

Examples 9–11 shows blank protonotation grids for duple, triple, and quadruple meters:

Example 9. *Grid for duple meter.*

Example 10. *Grid for triple meter.*

Example 11. *Grid for quadruple meter.*

In duple and triple meter, downbeats are represented by longer vertical lines, and non-accented beats are represented by shorter vertical lines. In quadruple meter, the third beat of each bar is of medium accent, so it is represented by a medium-length line.

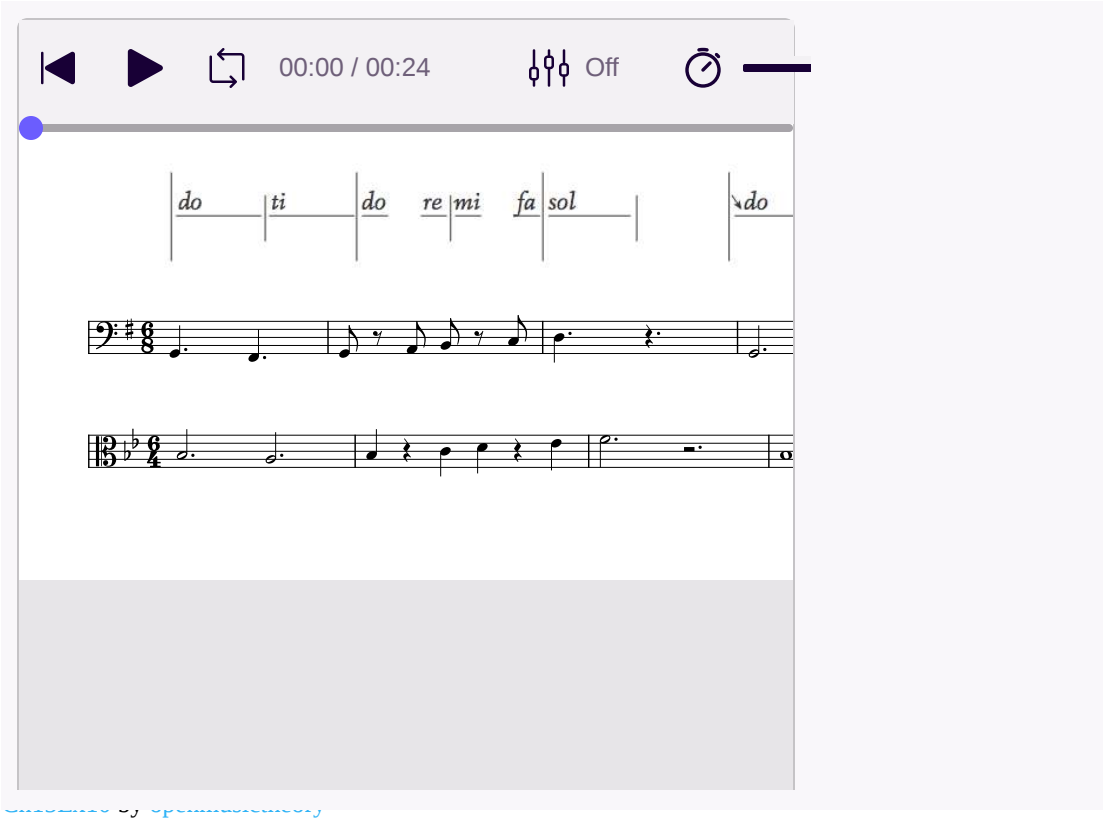
In protonotation, notes are notated by using horizontal lines for rhythmic duration and moveable-*do* solfège syllables (although scale degrees can be substituted). Arrows are used to denote the direction of any melodic leaps. Rests are represented by the absence of a horizontal line in a given beat or part of a beat. It can also be helpful to use an **X** instead of a blank, so you can distinguish a rest you are sure about from a part of the protonotation you haven't yet completed.

Converting Protonotation to Staff Notation

If you know 1) the clef, 2) the tonic pitch, and 3) either the beat duration or bottom number of the time signature, you can convert a melody in protonotation to staff notation easily.

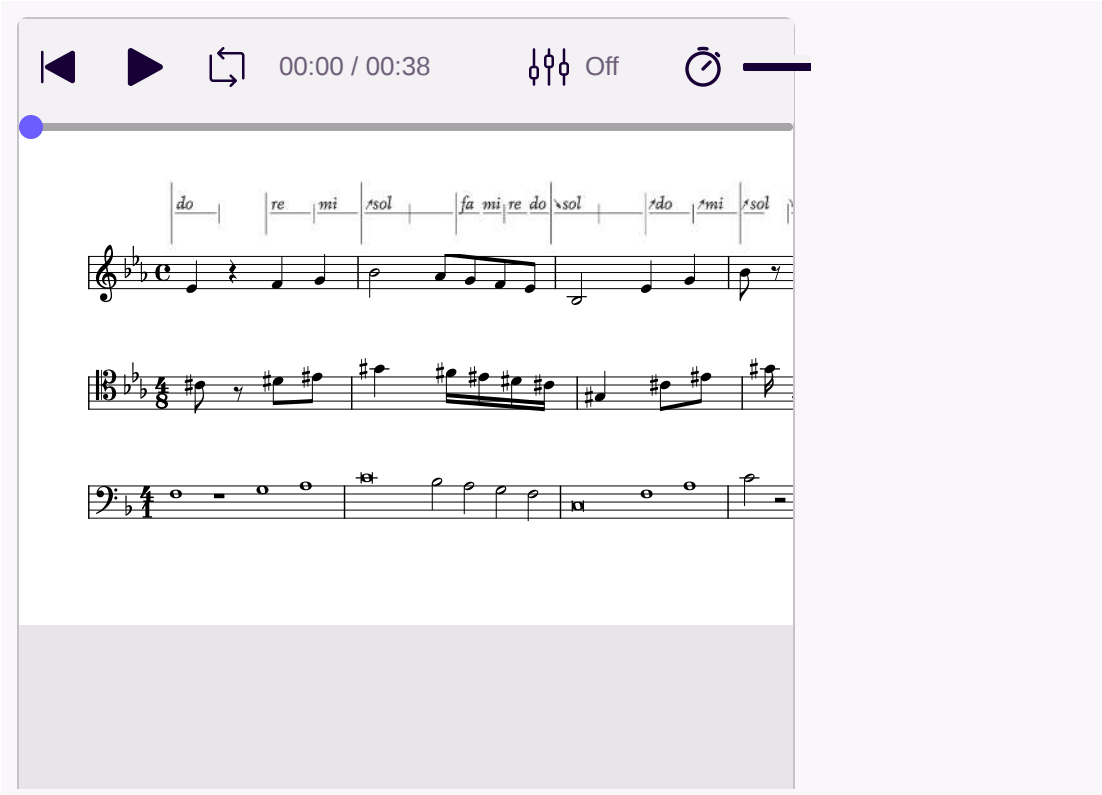
1. Write the basic information about the example:
    1. Draw the clef provided (or choose an appropriate one based on your perception of the register of the melody).
    2. Determine the key signature from the tonic provided and the mode (major or minor) that you heard or that was provided.
    3. Determine the time signature from the beat value / bottom number provided and from the meter reflected in your protonotation.
2. Each of the long protonotation lines becomes a bar line in staff notation.
3. Insert the notes into each bar:
    1. The register, solfège syllable, and tonic will determine the pitches.
    2. Use the time signature to determine how to translate the protonotated rhythms into specific note values. For example, a two-beat note in common time (quarter-note beat) is a half note (2 × 𝅗𝅥), while in cut time (half-note beat), it is a whole note (2 × 𝅝).

If the clef, tonic pitch, and/or time signature of the melody have not been specified, the same protonotation can be realized into staff notation in several different ways. **Example 12** shows a melody in protonotation that is realized in two different clefs, compound meters, and key signatures. The first realization is in bass clef in the key of G major, and the bottom number of its time signature is 8. The second realization is in alto clef in the key of B♭ major, and the bottom number of its time signature is 4.



Example 12. *Two different realizations of a melody in protonotation.*

Example 13 shows a melody in protonotation that is realized in three different clefs, compound meters, and key signatures. The first realization is in treble clef in the key of E♭ major, and the bottom number of its time signature is 4. The second realization is in tenor clef in the key of C♯ major, and the bottom number of its time signature is 8. The third realization is in bass clef in the key of F major, and the bottom number of its time signature is 1.



Three Realizations by openmusictheory

Example 13. *Three different realizations of a melody in protonotation.*

Like sight-singing and sight-counting, rhythmic and melodic dictation take many years to master. If you are an undergraduate music major, you will likely practice these skills throughout many classes, over many years. Again, be patient with yourself and meet with your instructor for help early on if you are struggling.

Further Reading

- Karpinsky, Gary. 2007. *Manual for Ear Training and Sight Singing*. New York: Norton.

Online Resources

- Melodies for Sight Singing with Recordings (How to Sing Smarter)
- Melodies for Sight Singing (Chorale Tech)
- Melodies for Sight Singing (Ronnie Sanders)
- Rhythms for Sight Counting (Blue Sky Music)
- Sight Singing by Level (YouTube)
- Melodic and Rhythmic Dictations (James Woodward, Youtube)
- Rhythmic and Melodic Dictations (freemusicdictations.net)
- Rhythmic Dictation (teoria)
- Rhythmic Dictation (Tone Savvy)
- Melodic Dictation (teoria)
- Melodic Dictation (Tone Savvy)

Assignments from the Internet

A. Writing Counts (.pdf)
B. Writing Solfège or Scale Degrees (.pdf)

Assignments

1. Solfège and Scale Degree Identification (.pdf, .docx)
2. Solfège and Scale Degree Identification in a Melodic Context (.pdf, .docx) Worksheet playlist

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CHAPTER OVERVIEW

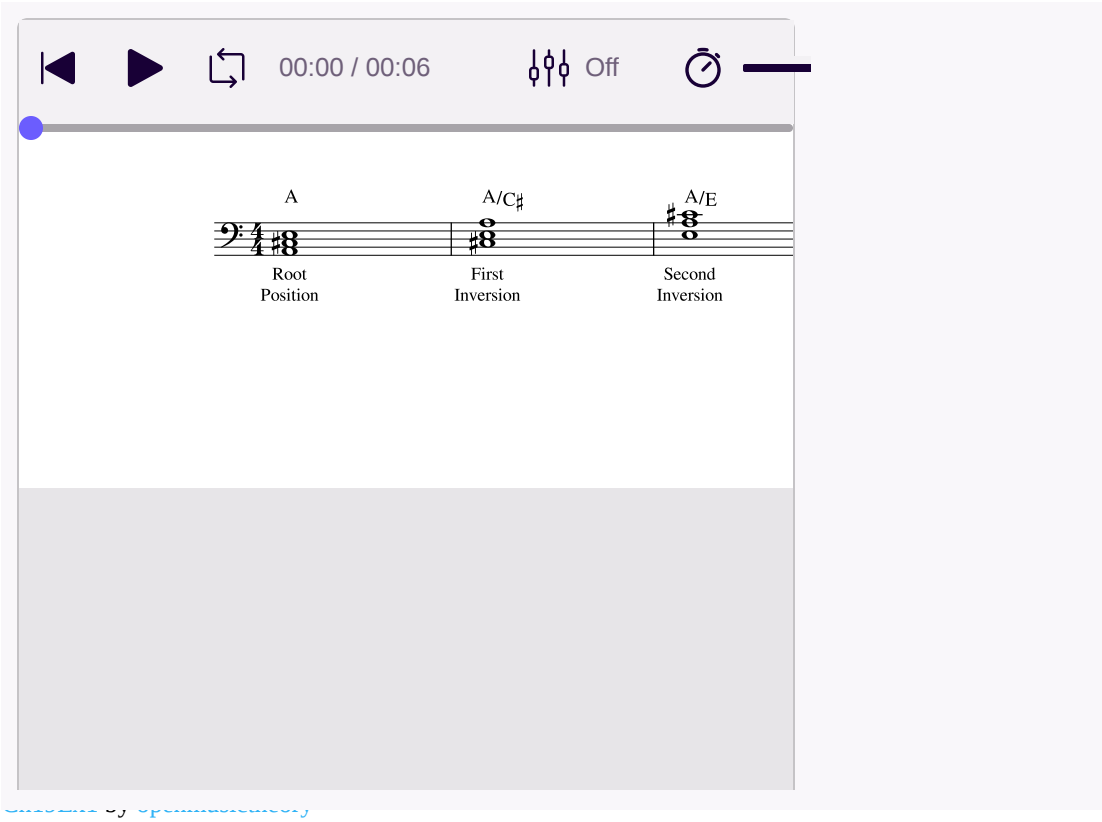
8: Unit 8- Inversion and Figured Bass

Key Takeaways

- The **bass voice** of triadic harmonies, often simply called the “bass,” determines **inversion**.
- Inverted harmonies do not have the root in the bass. When the third appears in the bass, we say the chord is in **first inversion**, when the fifth appears in the bass we say the chord is in **second inversion**, and when the seventh appears in the bass we say the chord is in **third inversion**.
- In addition to chord symbols, musicians also use **figured bass** to indicate inversion. Each triad and seventh chord is indicated by unique figures, which are often abbreviated.
- Figured bass is not usually added to chord symbols; however, it is added to triadic shorthand notation.
- It is called **realizing** figured bass when musicians turn figured bass into chords, either on paper or in performance.
- Triads and seventh chords are identified according to their **root**, **quality**, and **inversion**. Inversion includes the appropriate figures if applicable.
- In order to denote chromatic alterations to notes, musicians put accidentals (♭, ♯, ♮) before the figure that is altered. Musicians also use slashes through a figure or a plus sign before a figure, in order to indicate raising the note by a half step.

Triadic Inversion and Figures

Musicians often prioritize the note that is in the **bass voice** of triadic harmonies, often simply called the “bass,” which is the lowest part (or voice) of a composition, regardless of what instrument or voice type is singing or playing that lowest note. **Example 1** shows an A major triad with three different notes in the bass and chord symbols (above the staff):



Example 1. *An A major triad in root position, first inversion, and second inversion.*

An A major triad consists of three notes, the root (A), the third (C♯), and the fifth (E). When a triad is stacked in thirds (i.e. “snowperson form”), we say the triad is in root position. The bass note in root position is the root. Chords that do not have the root in the bass are said to be **inverted**, as summarized in **Example 2**:

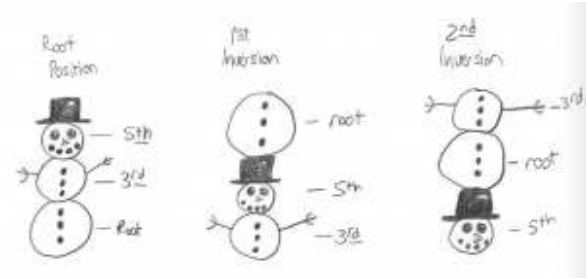
Inversion	Root	Bass
Root Position	Root	Root
First Inversion	Root	Third
Second Inversion	Root	Fifth

Example 2. *A summary of triadic inversions, root, and bass.*

As seen in **Example 2**, when the third appears in the bass, we say the triad is in **first inversion**, and when the fifth appears in the bass we say the triad is in **second inversion**.

It is important to note that the bass voice of the chord is NOT the same thing as the chord’s root. The root of an A major triad is always A, regardless of whether the triad is in root position, first inversion, or second inversion. However, the bass voice changes between these inversions, from A to C♯ to E, as seen in **Example 1** and **Example 2**.

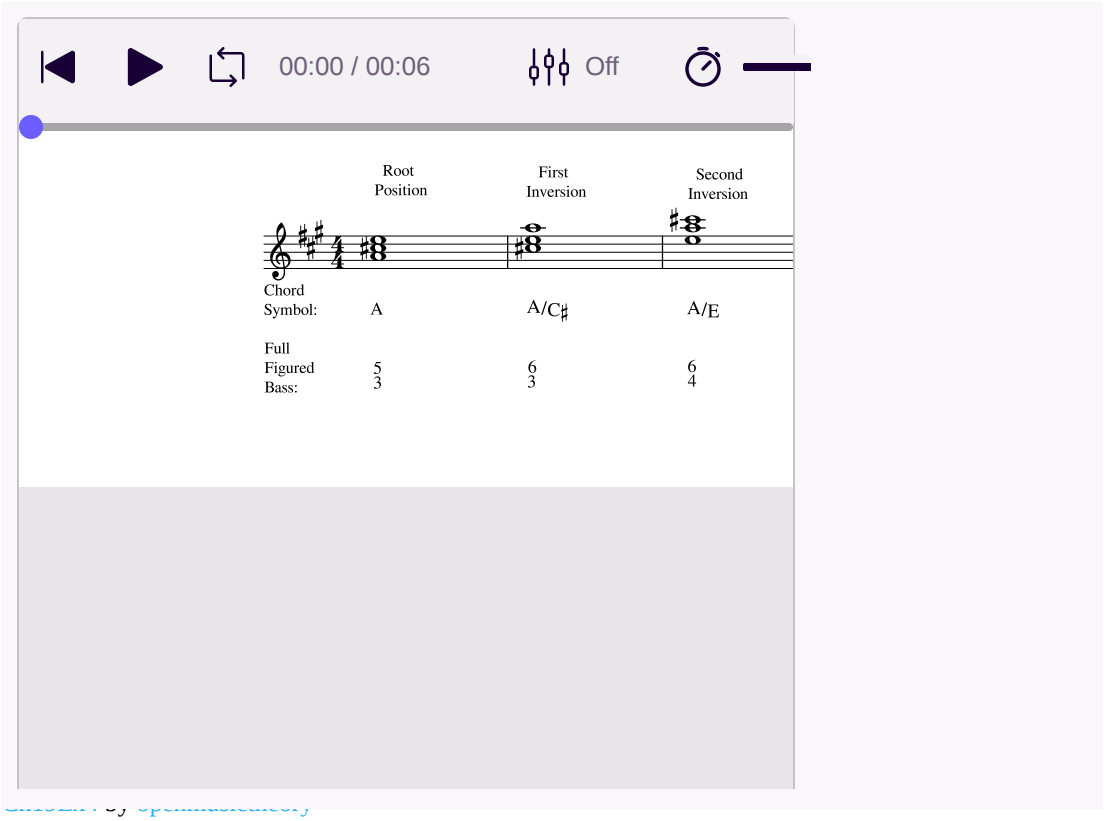
You might think of first inversion triads as looking like a snowperson whose feet have been moved above their head, while a second inversion triad looks like a snow person whose head has been moved to where their feet would normally appear. **Example 3** demonstrates this similarity:



Example 3. *Visual similarity between snowpeople and inverted triads.*

Sometimes musicians use chord symbols to indicate inversions, as seen in **Example 1**. However, musicians also use **figured bass** to indicate inversion. Figured bass uses Arabic numerals and some symbols which indicate intervals above the bass (NOT the root) note. These are then interpreted as chords by musicians.

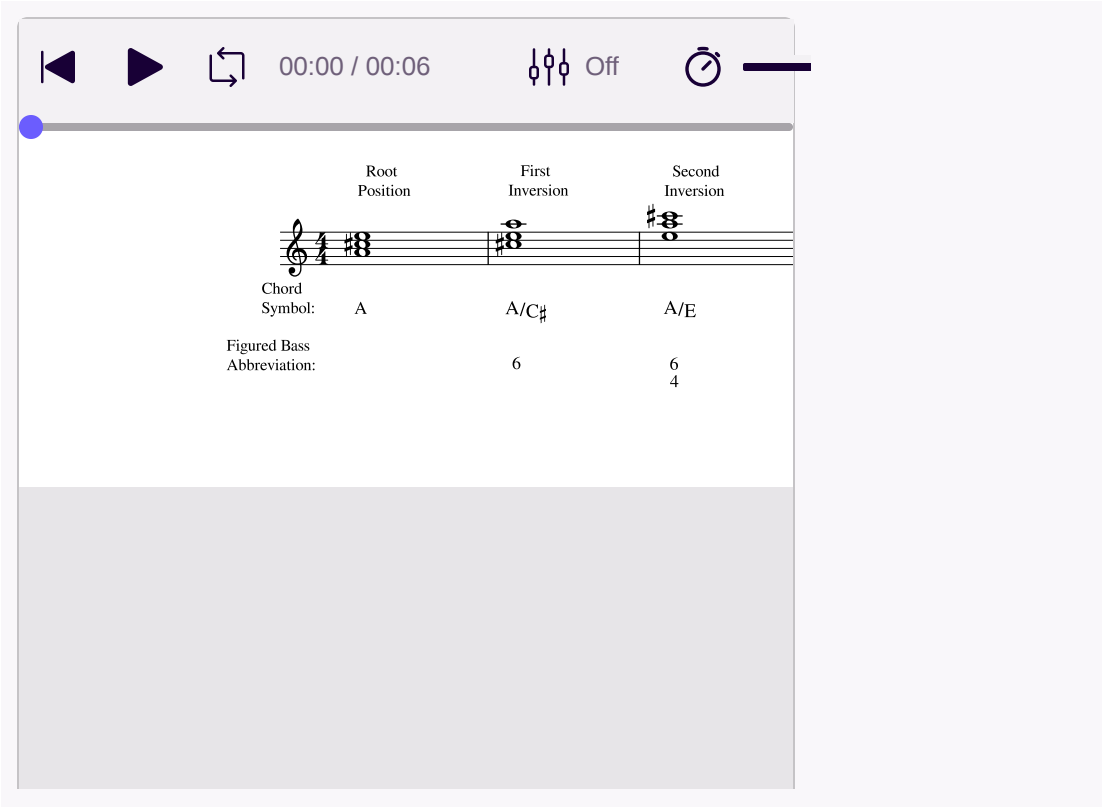
Example 4 shows the full figured bass for triads underneath their chord symbols:



Example 4. *The full figured bass for triadic inversions.*

As you can see in **Example 4**, a root position triad has a third and a fifth above the bass. A first inversion triad has a third and a sixth above the bass, while a second inversion triad has a fourth and a sixth above the bass. In figured bass, the larger numerals (intervals) always appear above the smaller ones.

Many centuries ago, however, musicians abbreviated the full figured bass for triads and seventh chords in order to save time and supplies (paper and ink were very expensive before the industrial revolution). **Example 5** shows the abbreviated figured bass for triads that we usually use today underneath their chord symbols:



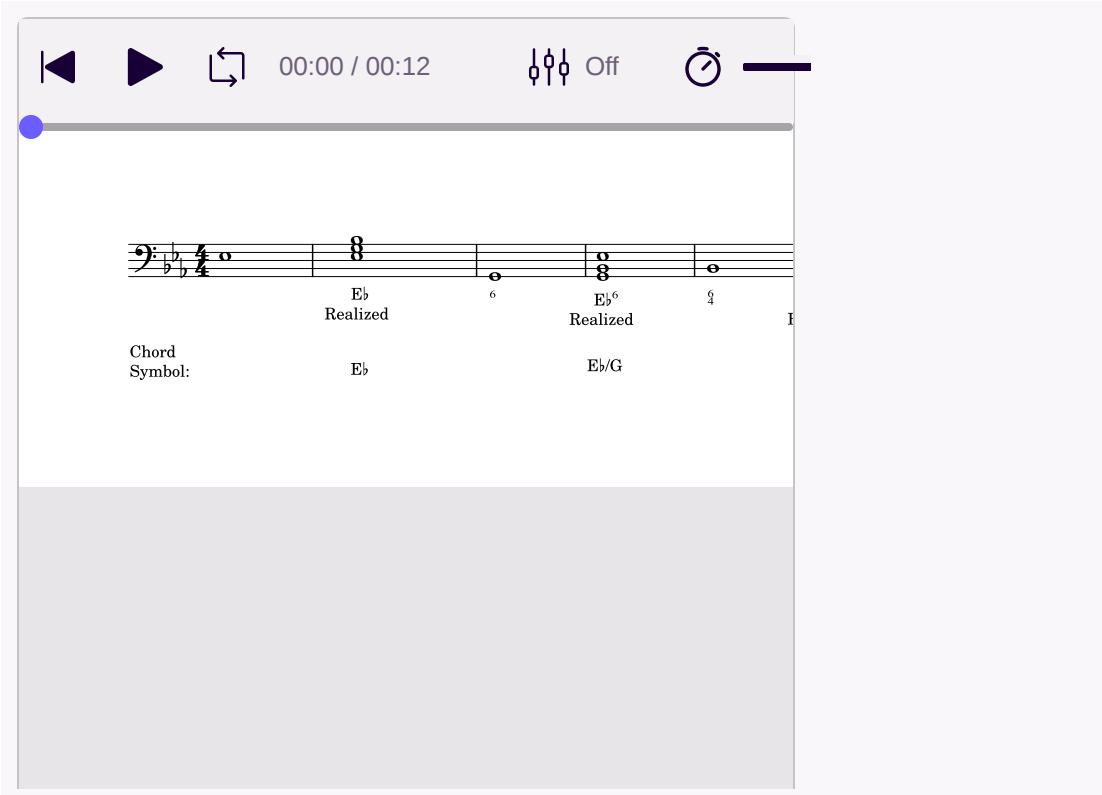
Chords by openmusictheory

Example 5. *The abbreviated figured bass for triadic inversions.*

As you can see, no figure appears for root position. First inversion triads are abbreviated with the superscript number “6,” while a second inversion triad keeps its full figures, “6464,” to distinguish it from a first inversion triad.

Figured bass is not usually added to chord symbols; however, it is added to triadic shorthand notation. For example, the last measure of **Example 5** would be notated as “A/E” in chord symbols. Using triadic shorthand, this chord would be notated as “A6464.”

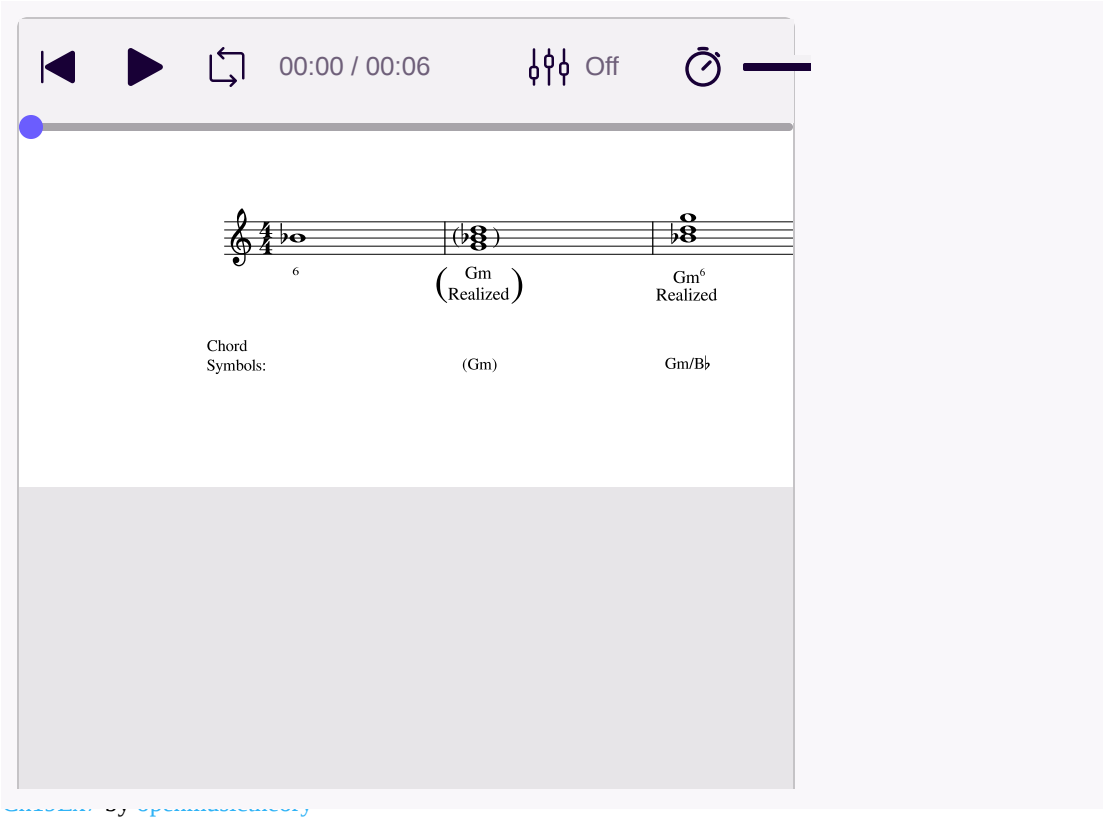
When musicians turn figured bass into chords—either on paper or in performance—this is called **realizing** the figured bass. **Example 6** shows the process of realization for several triads:



Example 6. *Some triads with figured bass and their realizations.*

As seen in the first measure of **Example 6**, an E♭ appears with no figured bass next to it. Therefore, we can assume that we are realizing an E♭ major triad in root position. This chord is realized (written out with notes) in the next measure. In measure 3, we see the number "6" below the bass note G. We can understand that notation to mean that we are realizing an E♭ major triad in first inversion. This chord is realized in the next measure. In measure 5, we see the figures "6464" below the bass note B♭. This notation means that we are realizing an E♭ major triad in second inversion, realized in the next measure.

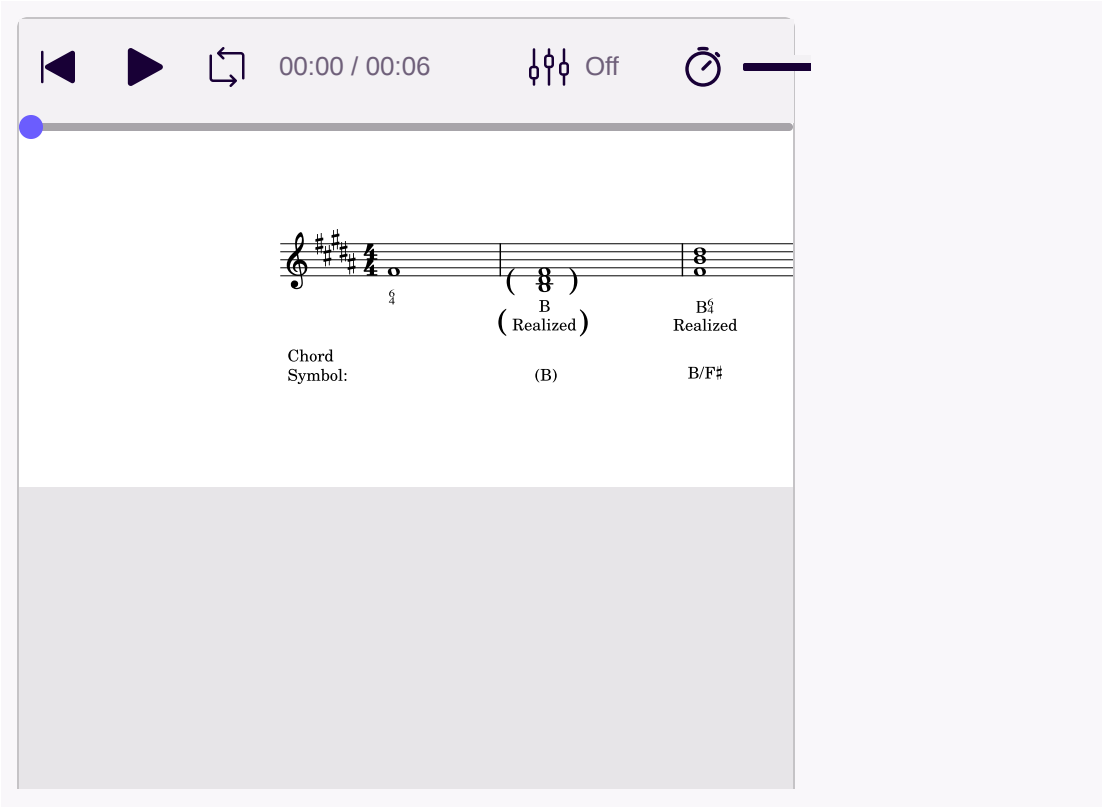
Example 7 shows the process of realization for a triad in first inversion in more detail:



Example 7. *Realizing a Gm triad in first inversion in three steps.*

As seen in **Example 7**, we first see the bass note B♭ with the figure "6" underneath. This means that the third of the triad is in the bass. We can now find the root of the chord, which is G. In the second measure of **Example 7**, a G minor triad in root position has been realized in parentheses. In the third measure of **Example 7**, the third of the chord (the B♭) is in the bass; now the triad is in first inversion. The last measure of **Example 7** is the correct "answer" or realization of this chord symbol.

Example 8 shows the process of realization for a triad in second inversion in more detail:



Example 8. Realizing a B triad in second inversion in three steps.

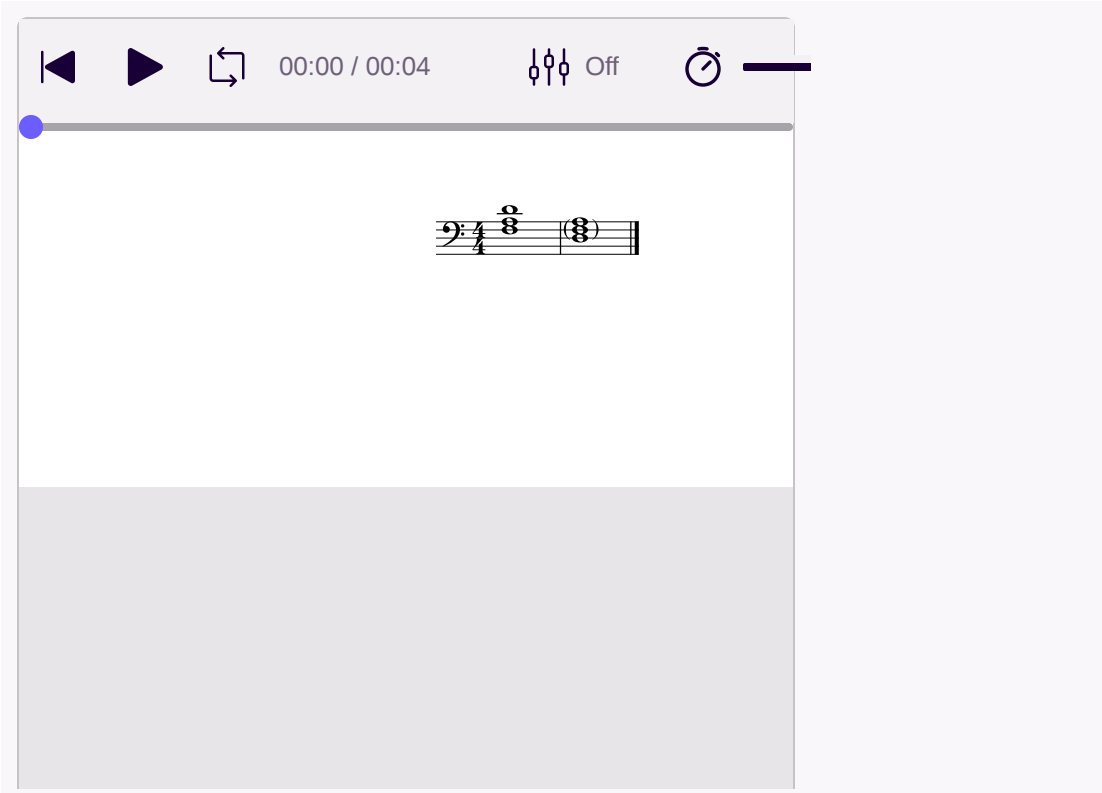
As seen in **Example 8**, we are realizing a B 6464 triad—a B major triad in second inversion. In the first measure, we see an F# with the figured bass "6464 "underneath. This means that the fifth of the triad is in the bass, and we must find the root of the chord, which is B. In the second measure of **Example 8**, a B major triad in root position has been realized in parentheses. In the third measure of **Example 8**, the fifth of the chord (the F♯) appears in the bass; this chord is now in second inversion. The last measure of **Example 8** is the correct "answer" or realization of this figure.

Identifying Triads

Triads are identified according to their **root**, **quality**, and **inversion**. With the addition of inversion, you can identify triads in four steps:

1. Identify and write its root.
2. Identify and write its quality.
3. Identify its inversion.
4. Write the appropriate figured bass figures if applicable.

Example 9 shows a triad in inversion (measure 1) and root position (measure 2):



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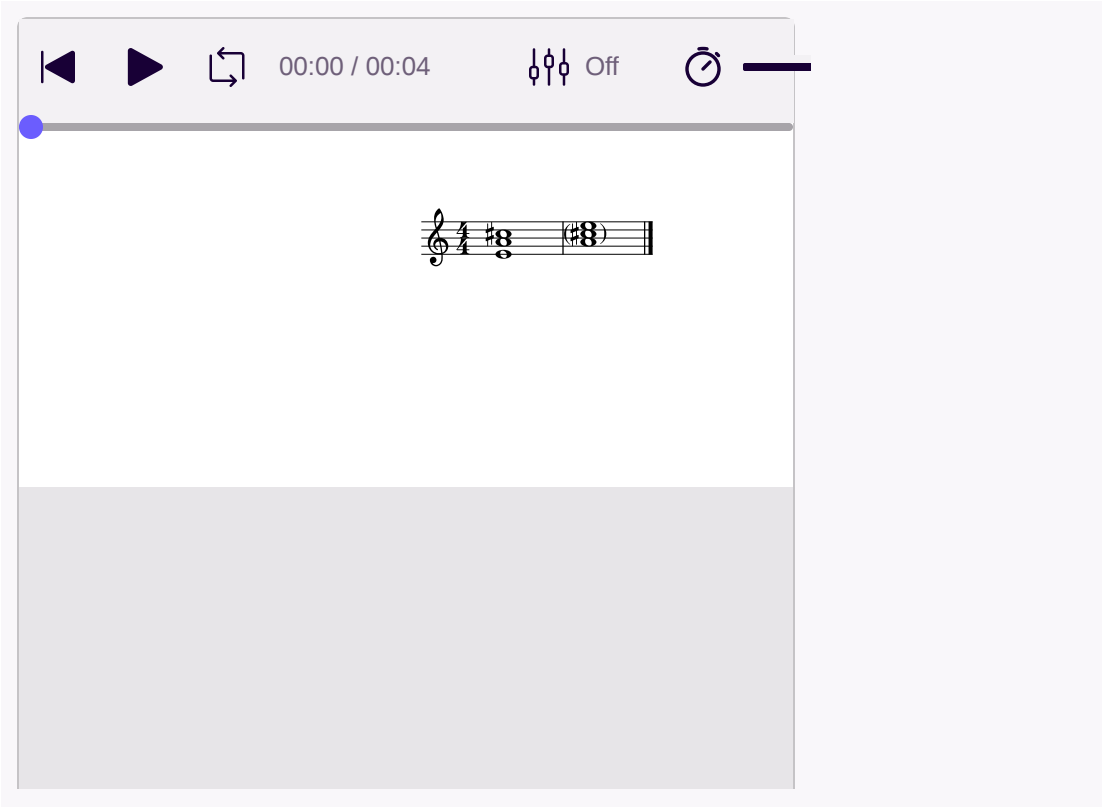
Example 9. *A triad in inversion (measure 1) and root position (measure 2).*

The four-step process of identification for the triad in measure 1 is as follows:

1. In measure 2, the chord has been put into root position. Now we can see the root of the triad is D.
2. This triad is minor.
3. The third of the triad is in the bass; therefore this triad is in first inversion.
4. Using figured bass, we would identify this triad as Dm^6. Using chord symbols, we would identify this triad as Dm/F.

Example 10 shows another triad in inversion (measure 1) and root position (measure 2):



Example 10. *A triad in inversion (measure 1) and root position (measure 2).*

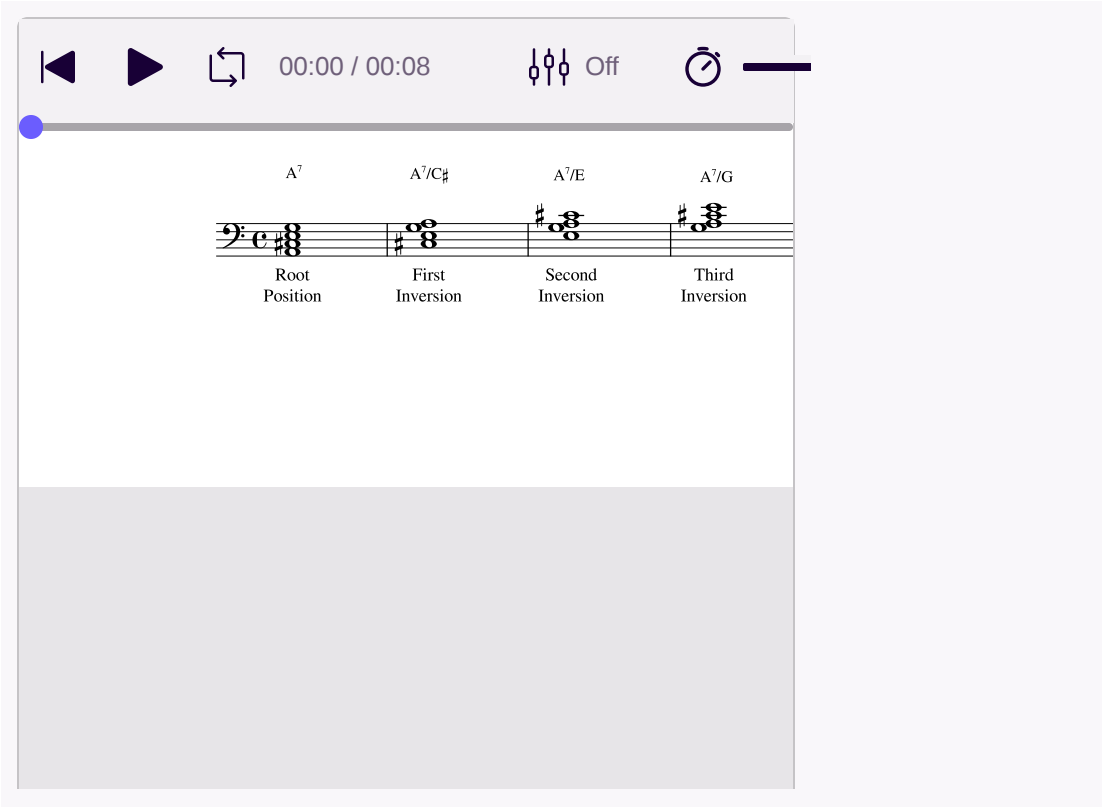
The four-step process of identification for the triad in measure 1 is as follows:

1. In measure 2, the chord has been put into root position. Now we can see the root is A.
2. This triad is major.
3. The fifth of the triad in the bass; therefore this triad is in second inversion.
4. Using figured bass, we would identify this triad is A6464. Using chord symbols, we would identify this triad as A/E.

Note that the second measure of **Example 9** and **Example 10** are in parentheses. It is recommended that you imagine the chord in root position rather than write it out in order to save time.

Seventh Chord Inversion and Figures

Like triads, seventh chords can also be **inverted**; in other words, their root doesn't necessarily have to be the bass. **Example 11** shows an A^7 chord in root position, first inversion, second inversion, and **third inversion**:



Example 11. *Seventh chord inversions.*

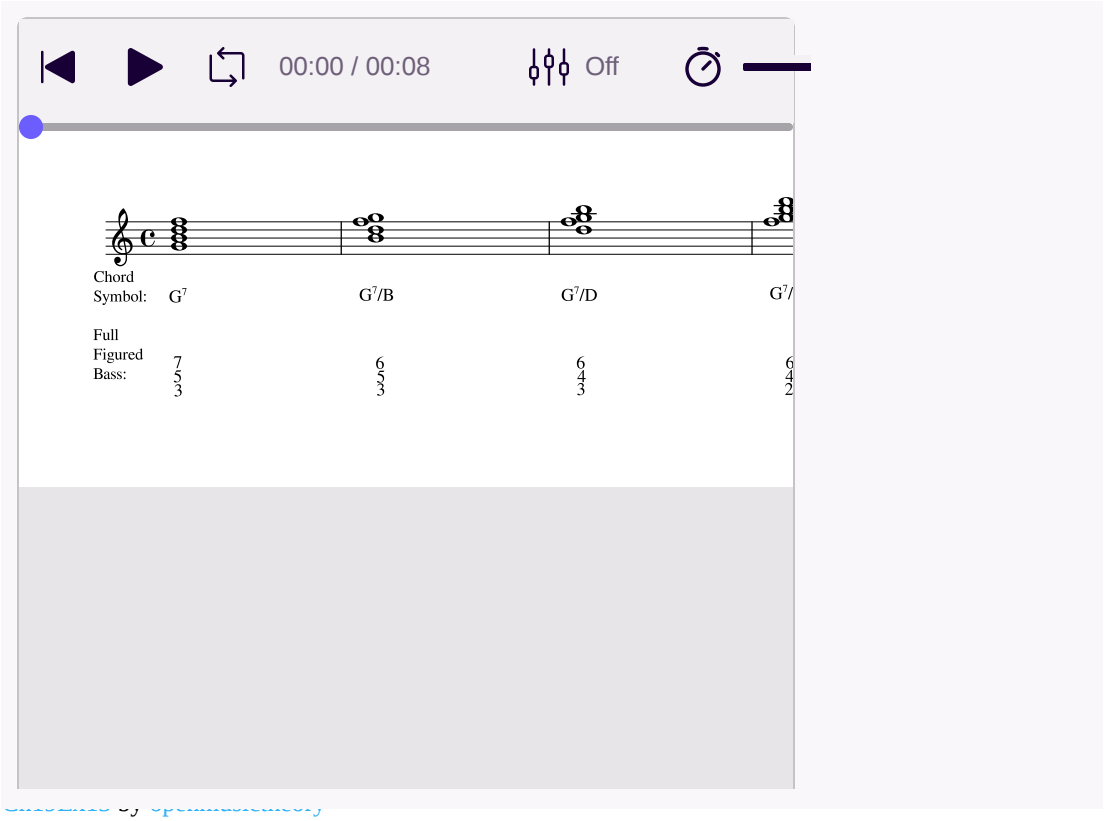
As you can see in **Example 11**, when a seventh chord has its root in the bass it is in root position. When the third appears in the bass it is in first inversion, and when the fifth appears in the bass it is in second inversion. Seventh chords have one more note than triads, so they have one additional inversion. When the chordal seventh of a seventh chord is in the bass it is in third inversion. Don't forget that the bass and the root of the chord are NOT synonymous. In **Example 11** the root of the chord is always A, regardless of its inversion and bass note.

A summary of the different seventh chord inversions can be seen in **Example 12**:

Inversion	Root	Bass
Root Position	Root	Root
First Inversion	Root	Third
Second Inversion	Root	Fifth
Third Inversion	Root	Seventh

Example 12. *A summary of seventh chord inversion, root, and bass.*

We also use **figured bass** to indicate the inversion of seventh chords. **Example 13** shows the full figured bass for seventh chords underneath their chord symbols:



Example 13. Seventh chord inversions with chord and figured bass.

As you can see in **Example 13**, a root position seventh chord has a third, fifth, and chordal seventh above the bass. A first inversion seventh chord has a third, fifth, and a sixth above the bass, while a second inversion seventh chord has a third, a fourth, and a sixth above the bass. Finally, a third inversion seventh chord has a second, a fourth, and a sixth above the bass.

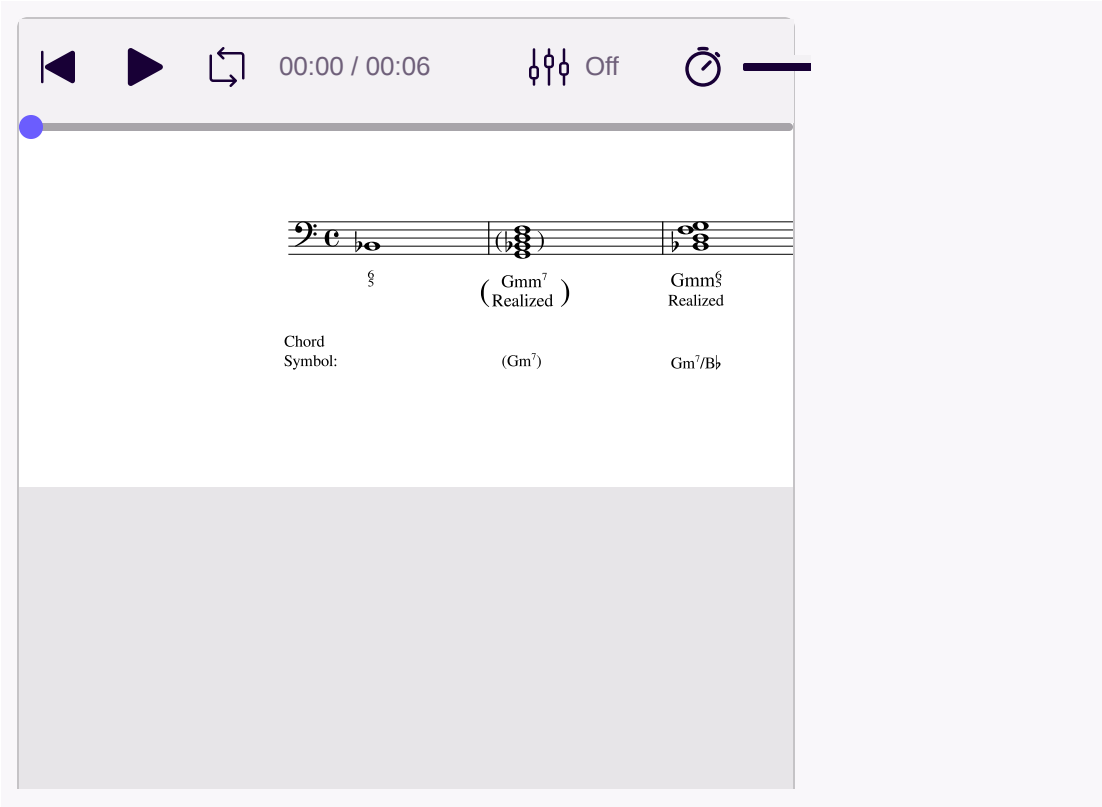
Example 14 shows the abbreviated figured bass for seventh chords that musicians use today underneath their chord symbols:

https://musescore.com/static/musesco...che=1627568710

Example 14. *The abbreviated figures for seventh chord inversion.*

As seen in **Example 14**, a root position seventh chord is abbreviated with just the number "7," while a first inversion seventh chord is abbreviated as "6556." A second inversion seventh chord is abbreviated "4334," and a third inversion seventh chord is abbreviated as "4224." Sometimes, in older style figured bass notation, a third inversion seventh chord is notated as "2."

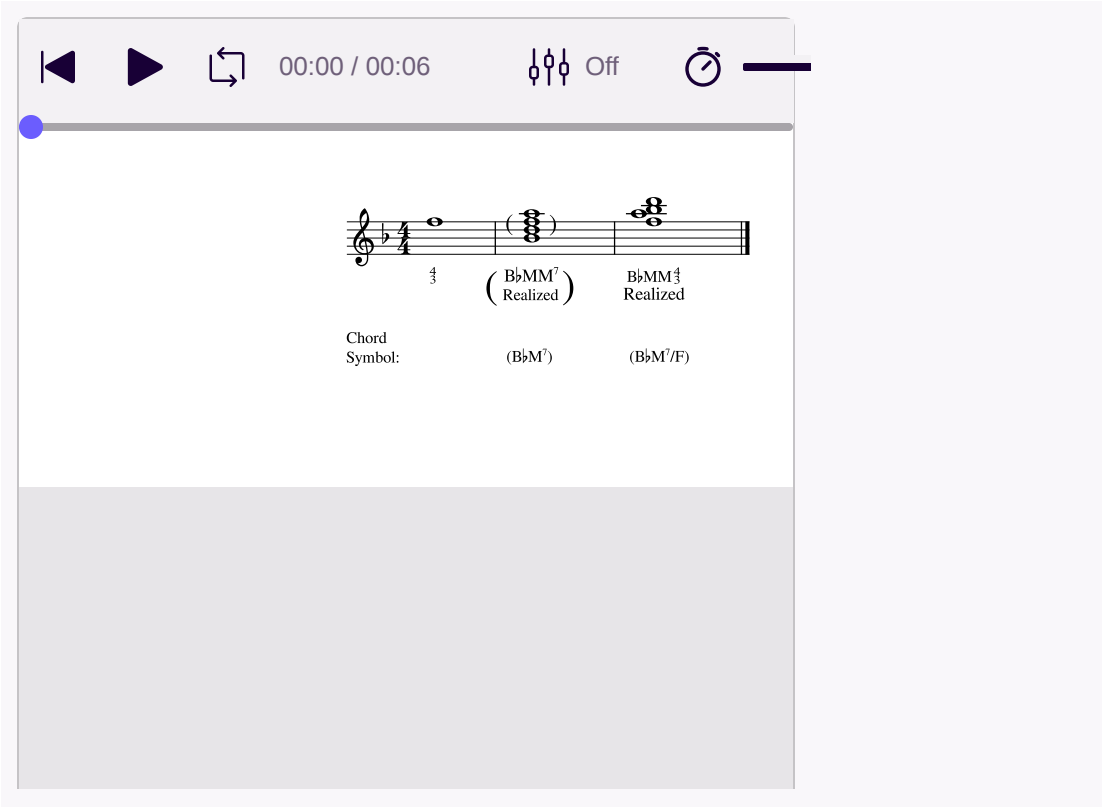
You can **realize** figured bass for inverted seventh chords in a similar way to how you realized them for triads. To realize an inverted seventh chord, first realize the chord in root position, then invert the chord. **Example 15** shows this process for a Gmm6556 chord (chord symbol Gmi^{7}/B♭).



Example 15. *Realizing an inverted seventh chord.*

As seen in **Example 15**, we first see the bass note B♭ with the figured bass "6556" underneath. This means that the third of the seventh chord is in the bass. We can now find the root of the chord, which is G. In the second measure of **Example 15**, a Gmm7 (chord symbol Gmi^7) seventh chord has been realized in parentheses. In the third measure of **Example 15**, the third of the chord (B♭) is in the bass; now the triad is in first inversion.

Example 16 shows another figured bass realization with inversion:



Example 16. Realizing an inverted seventh chord.

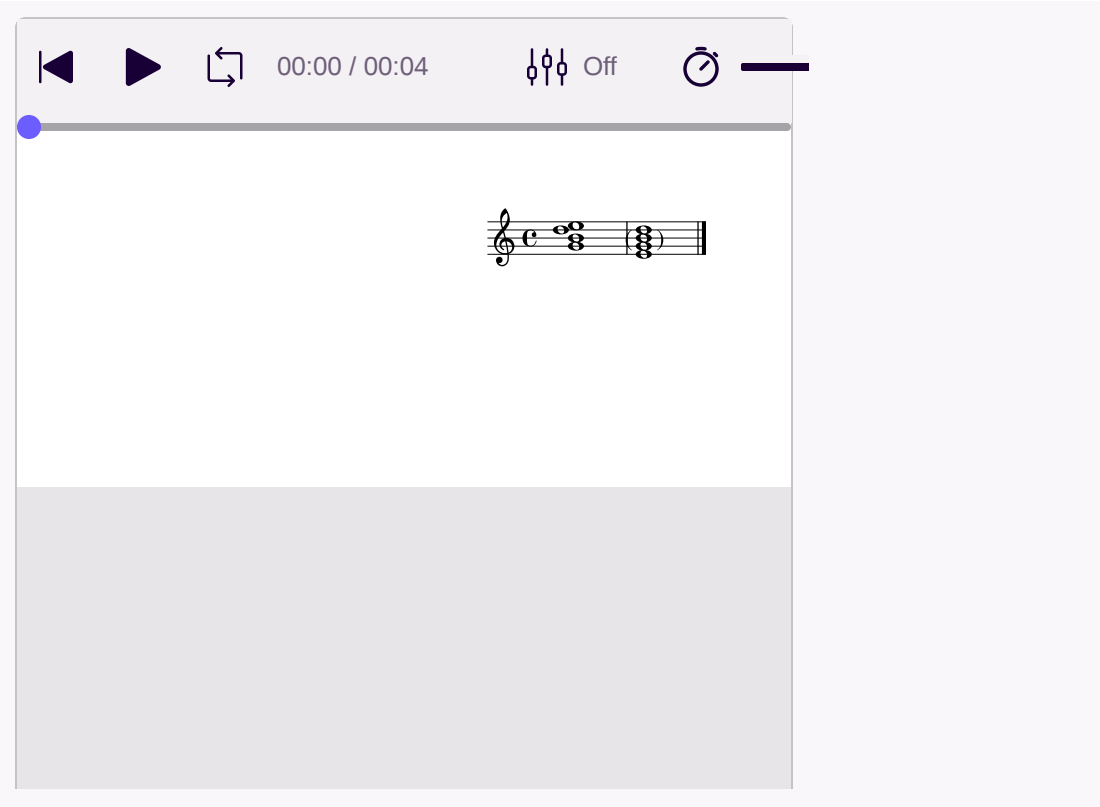
As seen in **Example 16**, we first see the bass note F with the figured bass "4334" underneath. This means that the fifth of the seventh chord is in the bass. We can now find the root of the chord, which is B♭. In the second measure of **Example 16**, a B♭MM^7 (chord symbol B♭M^7) seventh chord has been realized in parentheses. In the third measure of **Example 16**, the fifth of the chord (F) is in the bass; now the triad is in second inversion.

Identifying Seventh Chords

Like triads, seventh chords are also identified according to their **root**, **quality**, and **inversion**. You can identify seventh chords in five steps:

1. Identify and write its root.
2. Identify and write its quality of triad.
3. Identify and write its quality of seventh.
4. Identify its inversion if applicable.
5. Write the appropriate figured bass figures if applicable.

Example 17 shows a seventh chord in inversion and the process of identification:

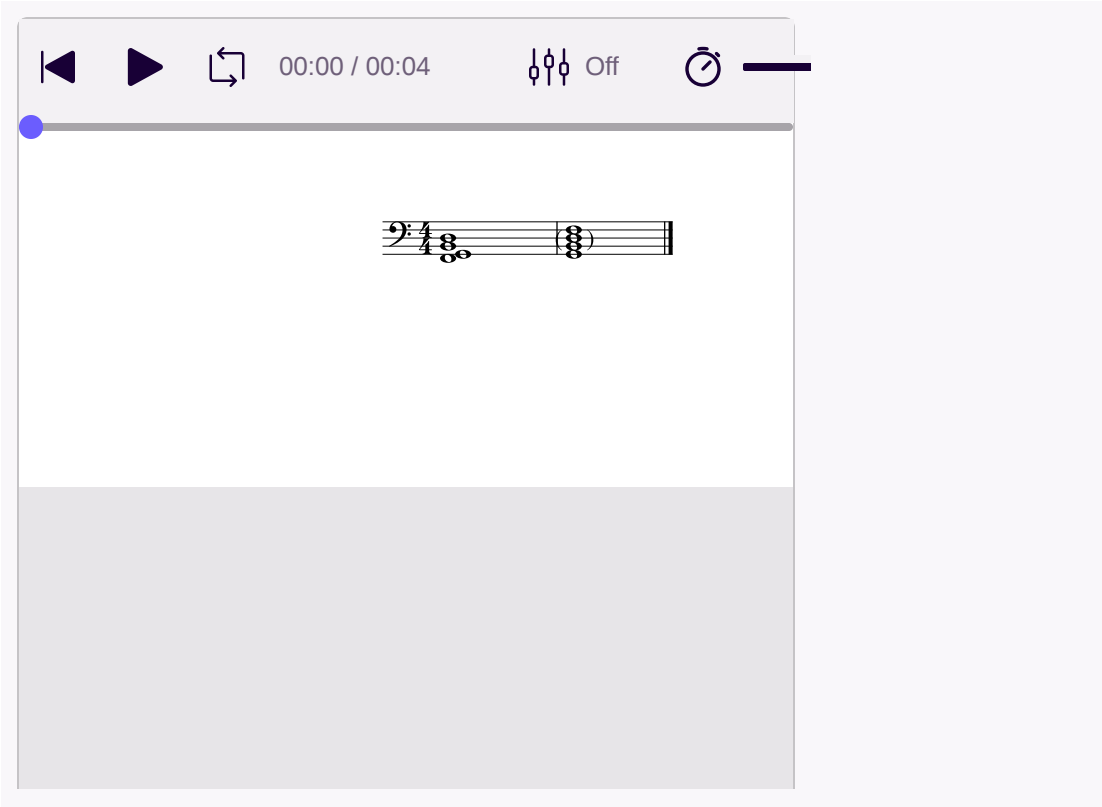


Example 17. *A seventh chord in inversion (measure 1) and root position (measure 2).*

The five-step process of identification for the seventh chord in measure 1 is as follows:

1. In measure 2, the seventh chord has been put into root position (measure 2). Now we can see the root of the chord is E.
2. This triad is minor.
3. The chordal seventh is also minor.
4. The original example is in first inversion, because the third is in the bass.
5. This chord is an Emm6556 (chord symbol Emi^{7}/G) chord.

Another seventh chord in inversion is shown in **Example 18**, along with the process of identification:



Example 18. *A seventh chord in inversion (measure 1) and root position (measure 2).*

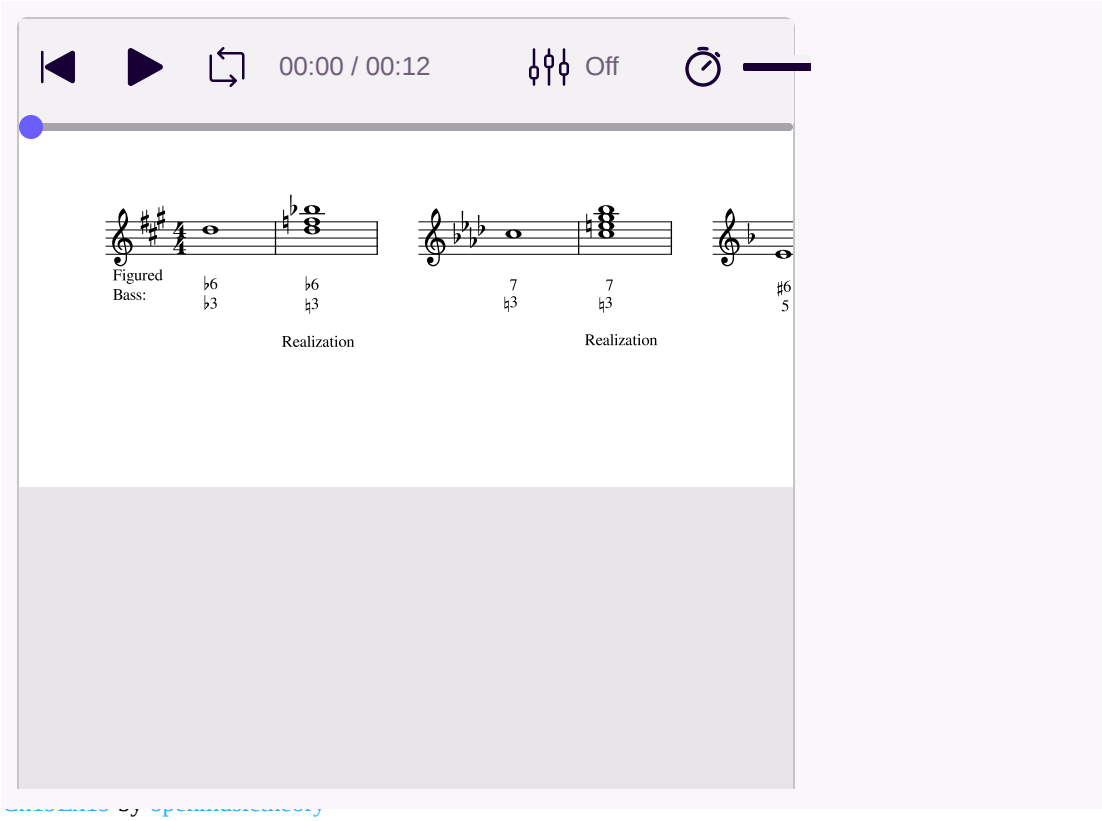
The five-step process of identification for the seventh chord in measure 1 is as follows:

1. In measure 2, the seventh chord has been put into root position (measure 2). Now we can see the root of the chord is G.
2. The triad is major.
3. The chordal seventh is minor.
4. The original example is in third inversion, because the seventh is in the bass.
5. This chord is an GMm4224 (chord symbol G^7/F) chord.

Note that the second measure of **Example 17** and **Example 18** are in parentheses. It is recommended that you imagine the chord in root position rather than write it out in order to save time.

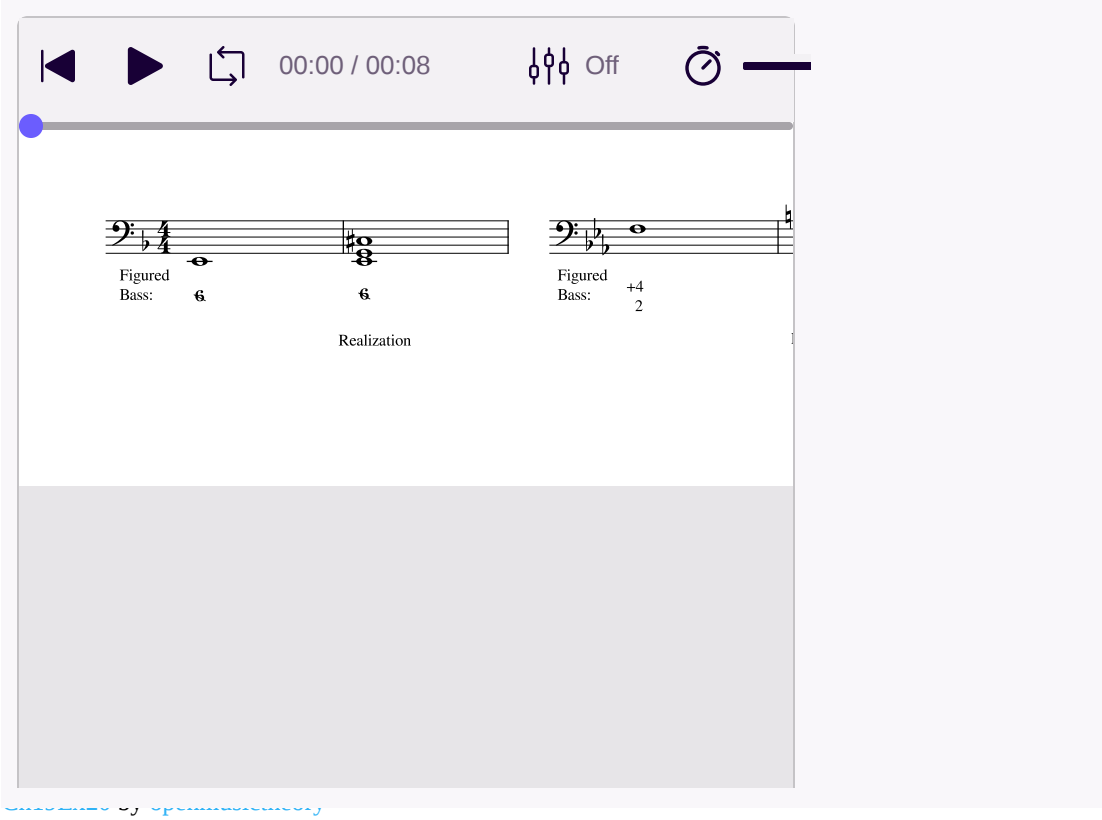
Other Figured Bass Symbols

In order to denote chromatic alterations to notes, musicians put accidentals (♭, ♯, ♮) before the figure that is altered. **Example 19** shows a few realizations of figures with accidentals:



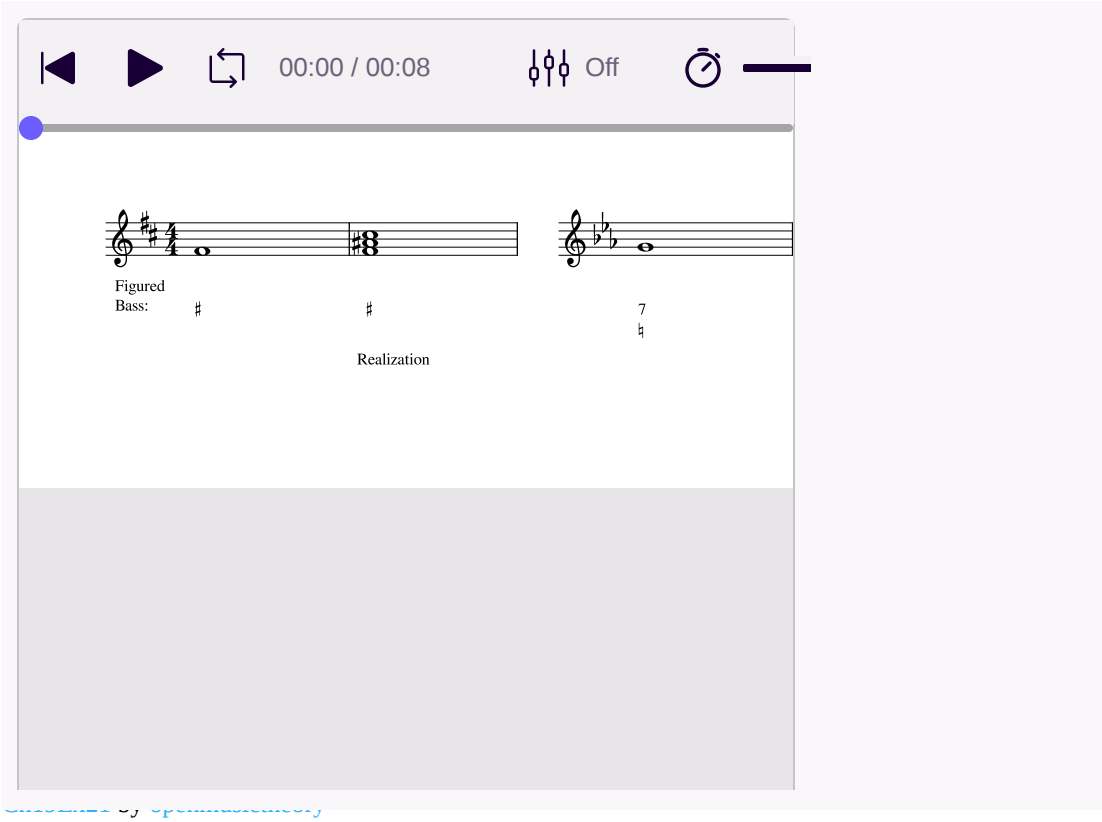
Example 19. *Realizations of figures with accidentals.*

Musicians also use slashes through a figure or a plus sign before a figure, in order to indicate raising the note by a half step. These symbols and their realizations are shown in **Example 20**:



Example 20. Realization of figures with other symbols.

An orphaned accidental (or hanging accidental) is also common. These are accidentals, that appear by themselves, not accompanying any other figure or symbol. In these cases, the accidental is assumed to apply to the third above the bass, as seen in **Example 21**:



Example 21. Realization of orphaned accidentals.

Take note that if only a "7" appears below the bass, a root position seventh chord is assumed. If no figures appear below the bass, a root position triad is assumed.

Online Resources

- Understanding Inversions of Triads and Seventh Chords (Justin Rubin)
- Triad Inversion (musictheory.net)
- Seventh Chord Inversion (musictheory.net)
- Figured Bass Inversion Symbols (Robert Hutchinson)
- Triad Chord Inversions (musictheoryacademy.com)
- How Do Chord Inversions Work? (Hello Music Theory)
- Chord Inversions (key-notes.com)
- Triad Chord Inversion (teoria)
- Figured Bass: How to Read Chord Inversion Symbols (LANDR)
- 7th Chord inversion (Gracemusic.us)
- Figured Bass (thinkingmusic.ca)
- What are Chord Inversions? (YouTube)
- What are Chord Inversions? Piano (YouTube)
- Seventh Chord Ear Training (teoria)
- Chord Ear Training (musictheory.net)
- Chord Ear Training (Tone Savvy)

Assignments from the Internet

A. Triad Construction (Inversion) (.pdf)
B. Triad Construction and Identification (Inversion), p.10 (.pdf), pp.4–8 (.pdf),
C. Triad Chord Identification (Inversion) (.pdf, .pdf)
D. Seventh Chord Construction (Inversion) (.pdf)
E. Seventh Chord Identification, Major (Root Position and Inversion), pp. 2–4 (.pdf)
F. Seventh Chord Identification, Minor (Root Position and Inversion), pp. 2–4 (.pdf)

Assignments

1. Triadic Inversions (.pdf, .mcsz)
2. Seventh Chord Inversions (.pdf, .mcsz)

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CHAPTER OVERVIEW

9: Unit 9- Advanced Topics

9.1: Roman Numerals and SATB Chord Construction
9.2: Texture

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SECTION OVERVIEW

9.1: Roman Numerals and SATB Chord Construction

Key Takeaways

- **Roman numeral analysis** is an analytical procedure in which musicians use Roman numerals to identify chords within the context of key signatures.
- Roman numerals identify the **scale degree** of the chord's root, the chord's **quality**, and any extensions or **inversions** the chord may include.
- Uppercase Roman numerals denote major triads, and lowercase Roman numerals denote minor triads. A ^{o} symbol after a lowercase Roman numeral represents a diminished triad, while a $^{+}$ sign after an uppercase Roman numeral represents an augmented triad.
- The Roman numeral quality of a seventh chord is dependent on the chord's triad; the exceptions are half-diminished and fully diminished seventh chords, whose qualities are dependent on their chordal seventh.
- When constructing a chord in **SATB style**, there are six rules to keep in mind: **stem direction**, **chord construction**, **range**, **spacing**, **voice crossing**, and **doubling**.

Writing Roman Numerals

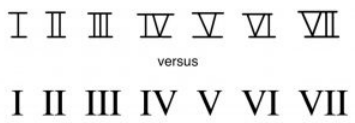
Music theorists use **Roman numerals** to identify chords within the context of key signatures. Roman numerals identify the **scale degree** of the chord's root, the chord's **quality**, and any extensions or **inversions** the chord may include. Because Roman numerals convey the same information across major and minor key signatures, using them can save time in analyzing Western **common practice** music.

The three columns of **Example 1** show the Arabic numerals 1 through 7 alongside the corresponding uppercase and lowercase Roman numerals.

Arabic Numeral	Uppercase Roman Numeral	Lowercase Roman Numeral
1	I	i
2	II	ii
3	III	iii
4	IV	iv
5	V	v
6	VI	vi
7	VII	vii

Example 1. *Arabic and Roman numerals.*

To type uppercase Roman numerals, use the uppercase Latin alphabet letters "I" and "V"; likewise, for lowercase Roman numerals, type the lowercase "i" and "v." The Roman numerals IV (4) and VI (6) are often confused; to remember the difference, think of IV (4) as V minus I (5 minus 1), and VI (6) as V plus I (5 plus 1).



Example 2. *The difference between handwritten and typed Roman numerals.*

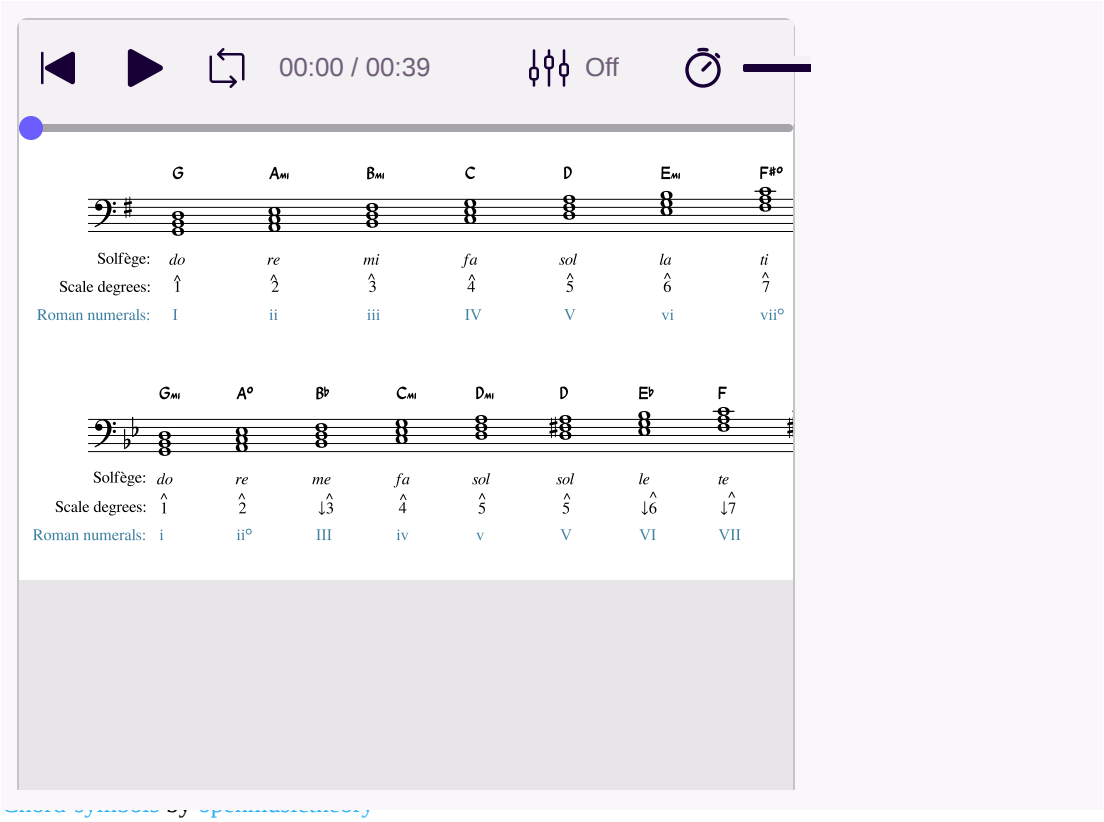
Handwritten uppercase Roman numerals have horizontal bars across the top and bottom of the numeral, in order to further distinguish between uppercase and lowercase (**Example 2**). There is no such difference with lowercase Roman numerals.

Roman Numerals and Triad Quality

Roman numerals indicate three things: the scale degree of a chord's root, the quality of the chord, and the chord's inversion (see Inversion below). The number represented by the Roman numeral (see **Example 1**) corresponds to the scale degree of the chord's root in whatever key the music is in. Uppercase Roman numerals denote major triads, and lowercase Roman numerals denote minor triads. For example, in a major key, a chord built on the first scale degree, ^11^ or *do*, is identified as "I," and a chord built on the second scale degree, ^22^ or *re*, is identified by the lowercase Roman numeral "ii." Lowercase Roman numerals followed by a superscript "o" (such as vii^{o}) represent diminished triads. Uppercase Roman numerals followed by a + sign (for example, the rare V+) represent augmented triads.

In the analysis of Western music, Roman numerals are generally placed below the bottom staff. Some music theorists prefer to use only uppercase Roman numerals, a system which assumes chord quality is intuited; in this textbook, we privilege the distinction of triadic qualities as denoted by uppercase and lowercase Roman numerals.

Example 3 shows the triads and seventh chords of a G major scale, labeled with chord symbols and now Roman numerals (in blue). The solfège and scale degree of the roots are also labeled.



Example 3. *Roman numerals of triads in major and minor keys.*

The Roman numerals and qualities of triads in major keys are as follows:

- I: major
- ii: minor
- iii: minor
- IV: major
- V: major
- vi: minor
- vii°: diminished

The Roman numerals and qualities of triads in minor keys are as follows:

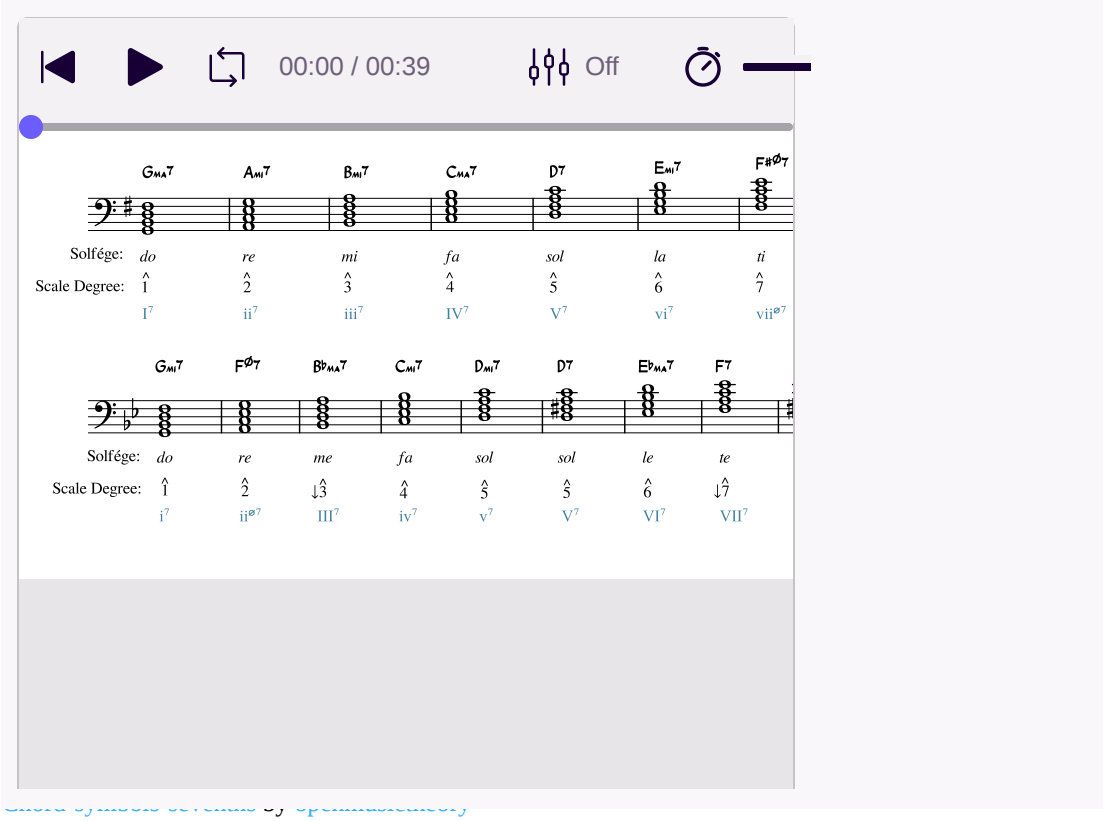
- i: minor
  - ii°: diminished
  - III: major
  - iv: minor
  - v: minor
  - V: major (raised leading tone)
  - VI: major
  - VII: major
  - vii°: diminished (raised leading tone)

Note that the quality of v/V and VII/vii^{o} differs depending on whether or not the leading tone is raised.

Roman Numerals and Seventh Chord Quality

Roman numeral labels for seventh chords add a superscript 7: for example, V^{7}, ii^{7}, and vii^{o7}. The capitalization of the Roman numeral depends on the quality of its triad: uppercase for a major triad (e.g., V^{7}), lowercase for a minor or diminished triad (e.g., ii^{7}). Half-diminished and fully diminished seventh chords, which both contain a diminished triad, are distinguished by an additional symbol after the lowercase Roman numeral: $^{\varnothing}$ for half-diminished (e.g., vii$^{\varnothing 7}$) and ^{o} for fully diminished (e.g., vii^{o7}).

Example 4 shows the triads and seventh chords of a G minor scale labeled with chord symbols and now Roman numerals (in blue). The solfège and scale degree of the roots are also labeled.



***Example 4**. Roman numerals of seventh chords in major and minor keys.*

The Roman numeral and qualities of seventh chords in major keys are as follows:

- I^{7}: major-major seventh (major seventh)
  - ii^{7}: minor-minor seventh (minor seventh)
  - iii^{7}: minor-minor seventh (minor seventh)
  - IV^{7}: major-major seventh (major seventh)

- V^7: major-minor seventh (dominant seventh)
- vi^7: minor-minor seventh (minor seventh)
- $vii^{\varnothing 7}$: half-diminished seventh

The Roman numeral and qualities of seventh chords in minor keys are as follows:

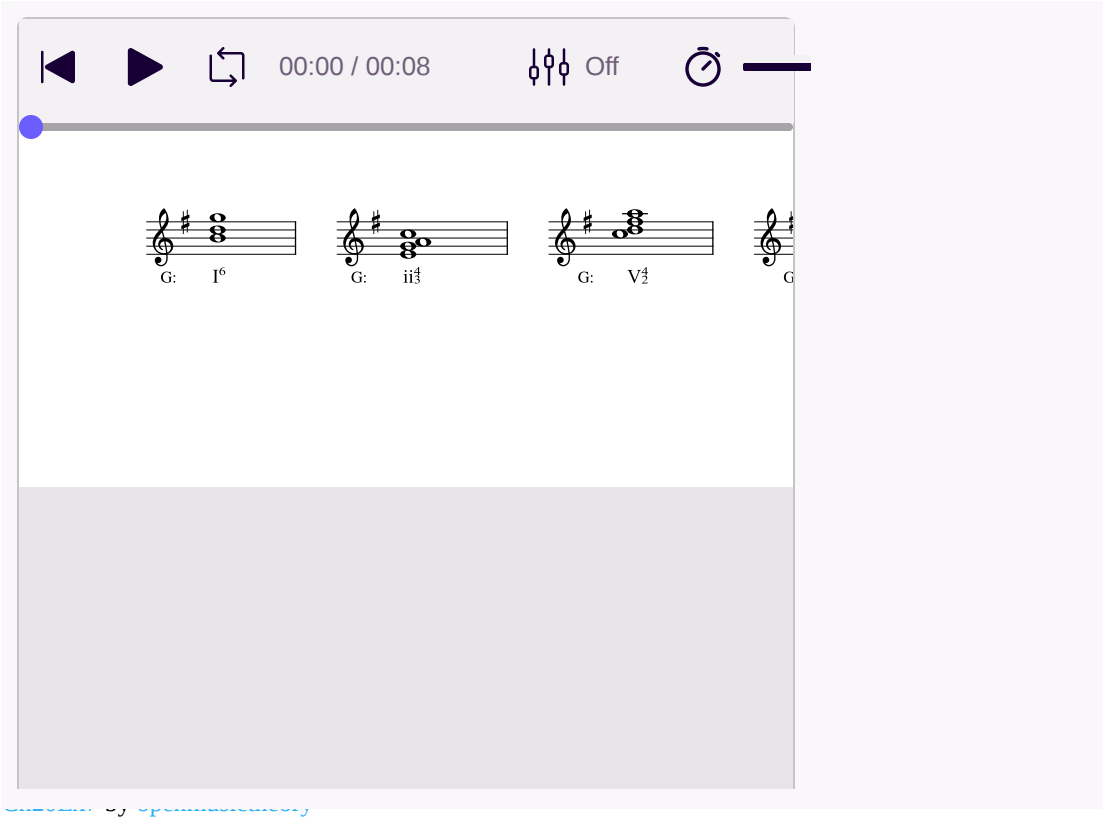
- i^7: minor-minor seventh (minor seventh)
- $ii^{\varnothing 7}$: half-diminished seventh
- III^7: major-major seventh (major seventh)
- iv^7: minor-minor seventh (minor seventh)
- v^7: minor-minor seventh (minor seventh)
- V^7: major-minor seventh (dominant seventh)
- VI^7: major-major seventh (major seventh)
- VII^7: major-minor seventh (dominant seventh)
- vii^{o7}: fully diminished seventh (diminished seventh)

Note that the quality of v^7/V^7 and VII^7/vii^{o7} differs depending on whether or not the leading tone is raised.

Additionally, major seventh and dominant seventh chords have the same Roman numeral nomenclature; in other words, a I^7 chord and a V^7 chord are written the same even though the former is a major seventh chord and the latter is a dominant seventh chord. The difference would be discerned from the musical context.

Inversion

Roman numerals also denote inversions, shown through figured bass symbols placed after the Roman numeral (see the Inversion and Figured Bass chapter). For example, a superscript 6 represents a first inversion triad, and the figures 4334 would indicate a second inversion seventh chord. **Example 5** shows four different inverted chords with Roman numerals:



Example 5. *Four inverted chords with Roman numerals and figures.*

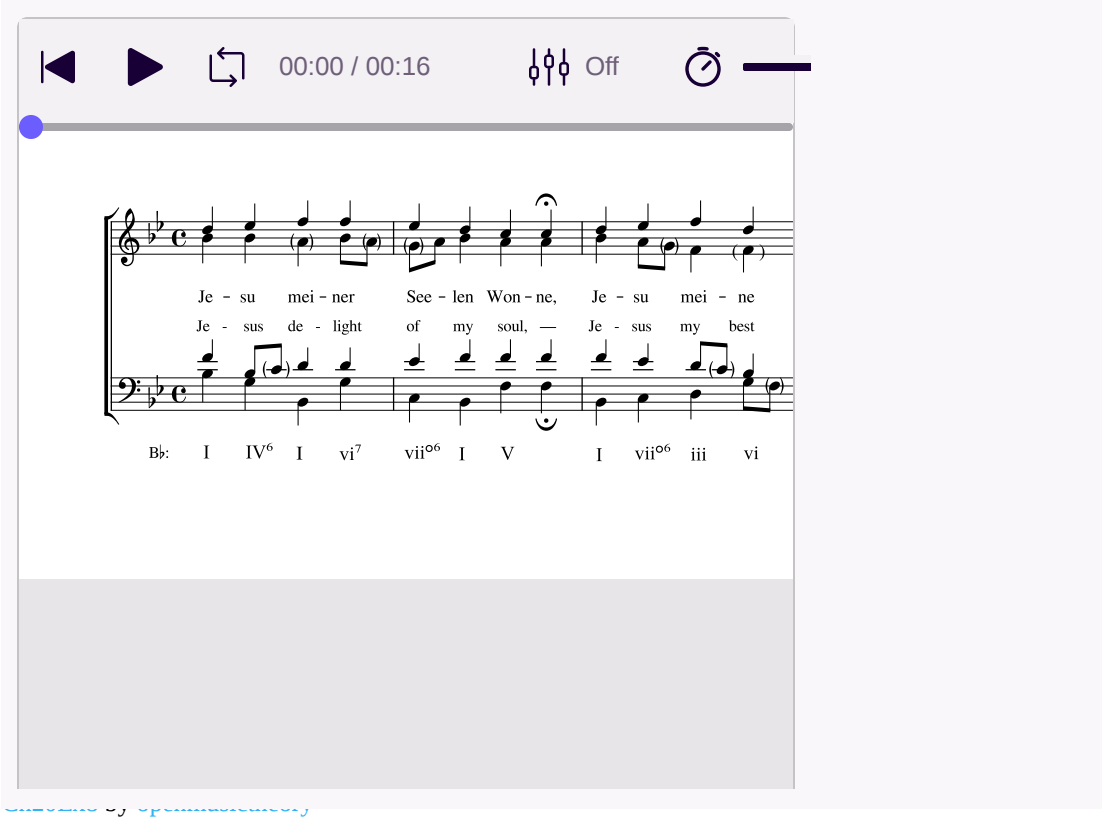
Roman Numeral Analysis

To complete a Roman numeral analysis, begin by identifying the work's key and writing it under the key signature at the beginning of the work, using an uppercase letter name for a major key and a lowercase letter name for a minor key. It can also be helpful to write a lowercase "m" following the letter name of a minor key (e.g., "dm" for D minor). Be sure to apply any applicable accidental (e.g., "E♭" for E-flat major).

After you identify and write the key at the start of the work, follow these steps for each chord to complete the Roman numeral analysis:

- 1. If a chord is in inversion, stack it in **root position** (preferably mentally).
  2. Identify all the notes of the chord, taking its quality into account.
  3. Write the Roman numeral that corresponds with the scale degree of the chord's root, reflecting the quality in the Roman numeral (uppercase or lowercase).
  4. Write any additional quality symbols (^{o}, $^{\varnothing}$, $^{+}$) as needed.
  5. Write figures after the Roman numeral.

Example 6 shows a Roman numeral analysis for Johann Sebastian Bach's chorale "Jesu meiner Seelen Wonne" (1642), which translates to "Jesus, delight of my soul." When analyzing this chorale, ignore the notes in parentheses. It is recommended that you cover up the Roman numerals in this example and try to generate them on your own before uncovering them:



Example 6. *Roman numeral analysis of an excerpt of Johann Sebastian Bach's "Jesu, meiner Seelen Wonne" (BWV 359).*

Roman numeral analysis is not just limited to chorales; indeed, you can apply them to many different genres of music. **Example 7** shows an excerpt from "Caro Mio Ben" (c. 1783), which translates to "Dearly beloved" and is attributed to Guiseppe Giodani, with a Roman numeral analysis:

Example 7. *Roman numeral analysis of an excerpt of Giuseppe Giordani's "Caro Mio Ben."*

When the same chord occurs two or more times in a row, which is common, you can choose whether to repeat the Roman numeral (as in measure 1 of **Example 7**) or not (as in measure 2 of **Example 6**).

Writing Chords in SATB Style

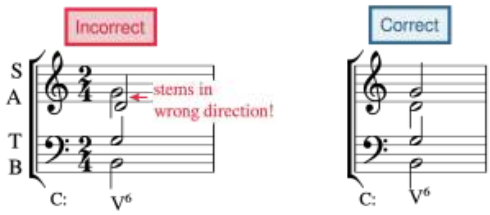
Music theorists sometimes simplify compositions into four parts (or voices) in order to make their harmonic content more readily accessible. This practice is called **SATB style**, abbreviated after the four common voice parts of a choir—**soprano** (S), **alto** (A), **tenor** (T), and **bass** (B). When constructing a chord in strict SATB style, there are six rules musicians generally follow:

- **Stem Direction**
- **Chord Construction**
- **Range**
- **Spacing**
- **Voice Crossing**
- **Doubling**

These six parameters form the basis of counterpoint and part writing, explored further in the sections Counterpoint and Galant Schemas and Diatonic Harmony, Tonicization, and Modulation.

Stem Direction

On a grand staff in SATB style, the soprano and alto are written in the treble clef (upper staff), while the tenor and bass are written in the bass clef (lower staff). The soprano and tenor voices receive up-stems, while the alto and bass parts receive down-stems. If the stem direction is crossed, this is an error. **Example 8** shows a chord with incorrect stemming, followed by the corrected version.



Example 8. *A stemming error.*

Chord Construction

Example 9. *A chord construction error.*

Be sure to check each chord for correct notes and accidentals, and make sure that your chords are not missing any notes. In **Example 9**, the first chord has accidentals erroneously added to two of the pitches, which are removed in the second chord to create a correct B diminished triad in first inversion.

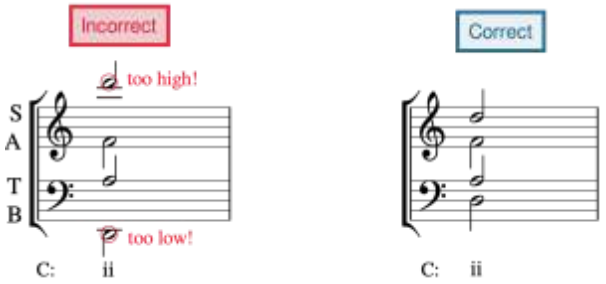
The bass voice must always correspond with the **inversion** that the Roman numeral's **figures** indicate. However, the order of the upper notes can be arranged in many ways. In other words, there is not necessarily just one correct way to voice a chord.

Range

Example 10. *Vocal ranges.*

There is a generally accepted range for each voice (**Example 10**):

- Soprano – C_4 to G_5
- Alto – G_3 to D_5
- Tenor – C_3 to G_4
- Bass – F_2 to D_4



Example 11. *A range error.*

In **Example 11**, the soprano and bass notes are out of range; this is corrected by moving the soprano note down by an octave and the bass note up by an octave.

Spacing

Example 12. *A spacing error.*

There should be no more than an octave between adjacent upper voices (soprano and alto, alto and tenor) and no more than a twelfth between the tenor and bass. The most common spacing error occurs between the alto and tenor because the notes appear in different clefs. **Example 12** first shows a chord with incorrect spacing—the soprano and alto are more than an octave apart, as are the alto and tenor—followed by a corrected version:

Voice Crossing

Example 13. *A voice crossing error.*

The ranges of voices should not cross. In other words, the soprano must always be higher than the alto, the alto must always be higher than the tenor, and the tenor must always be higher than the bass. In **Example 13**, the alto and tenor voices are crossed. This

SECTION OVERVIEW

9.2: Texture

Key Takeaways

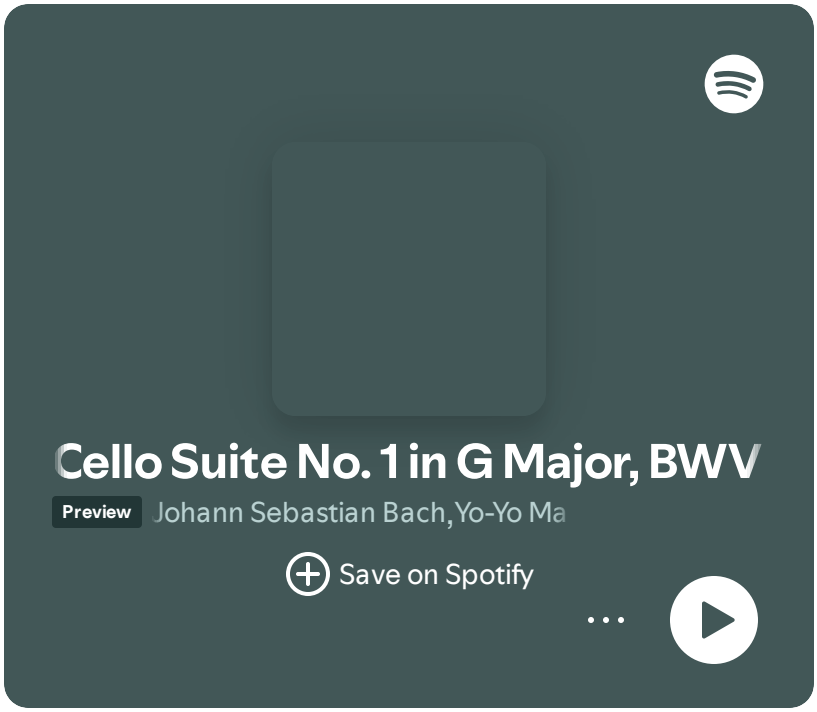
- Musical **texture** is the density of and interaction between a work's different voices.
- **Monophony** is characterized by an unaccompanied melodic line.
- **Heterophony** is characterized by multiple variants of a single melodic line heard simultaneously.
- **Homophony** is characterized by multiple voices harmonically moving together at the same pace.
- **Polyphony** is characterized by multiple voices with separate melodic lines and rhythms.
- Most music does not conform to a single texture; rather, it can move between them.

CHAPTER PLAYLIST

Texture is an important (and sometimes overlooked) aspect of music. There are many types of musical texture, but the four main categories used by music scholars are **monophony**, **heterophony**, **homophony**, and **polyphony**.

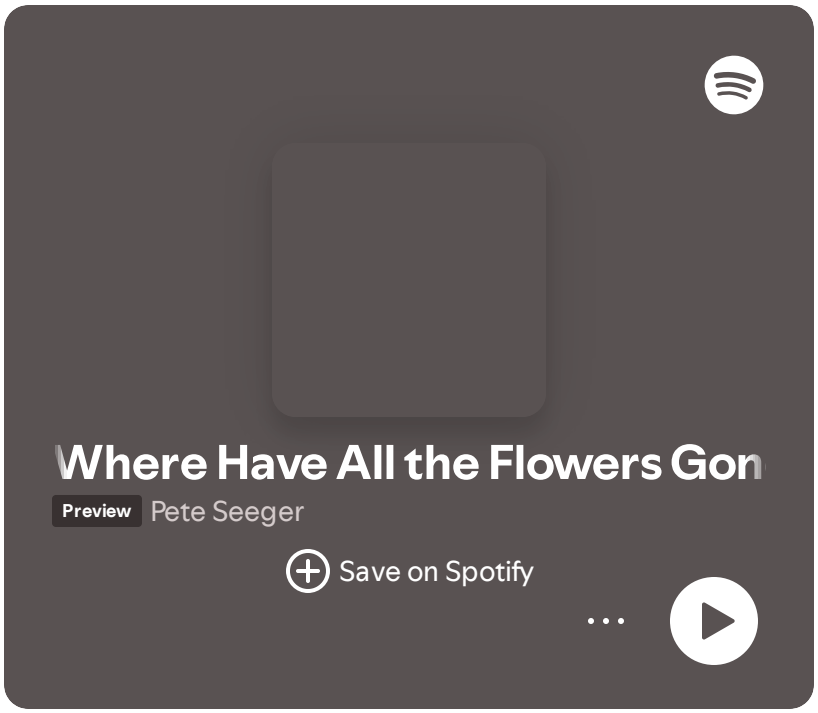
Monophony

A **monophonic** texture is characterized by a single unaccompanied melodic line of music. Monophony involves all instruments playing or singing in unison, making it the simplest and most exposed of all musical textures. The first movement of Cello Suite no. 1 in G Major (1717) by Johann Sebastian Bach is an example of a monophonic texture. Notice how the solo cello line is the only voice in this work.



Example 1. *Cello Suite no. 1 in G Major, I. Prelude, (BWV 1007) by Johann Sebastian Bach, performed by Yo-Yo Ma.*

Now let's listen to "Where Have All the Flowers Gone?" (1955) by Pete Seeger. Note that Seeger's voice is the only musical line; therefore, this work is a second example of monophony.

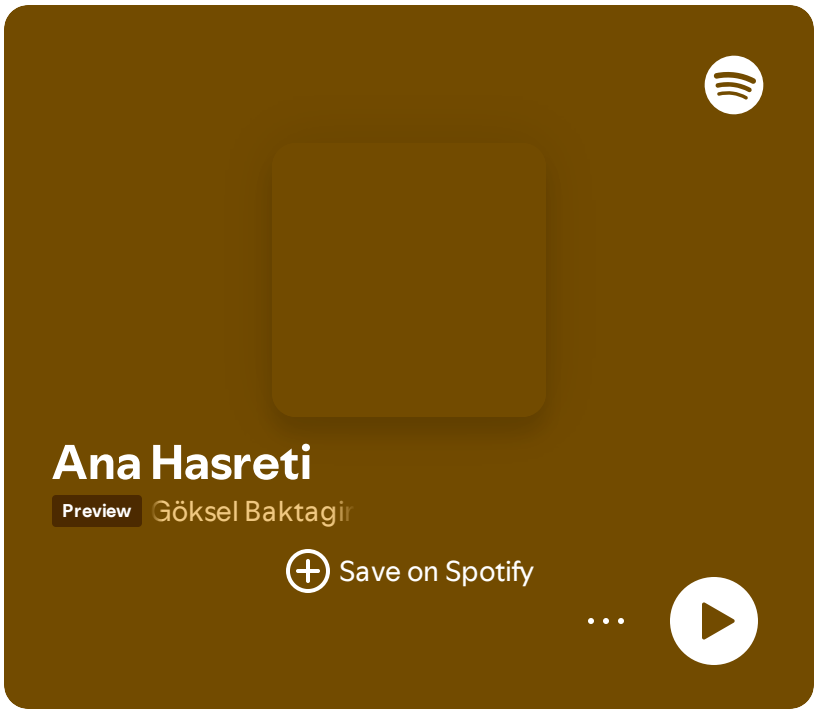


Example 2. *"Where Have All the Flowers Gone?" by Pete Seeger.*

Heterophony

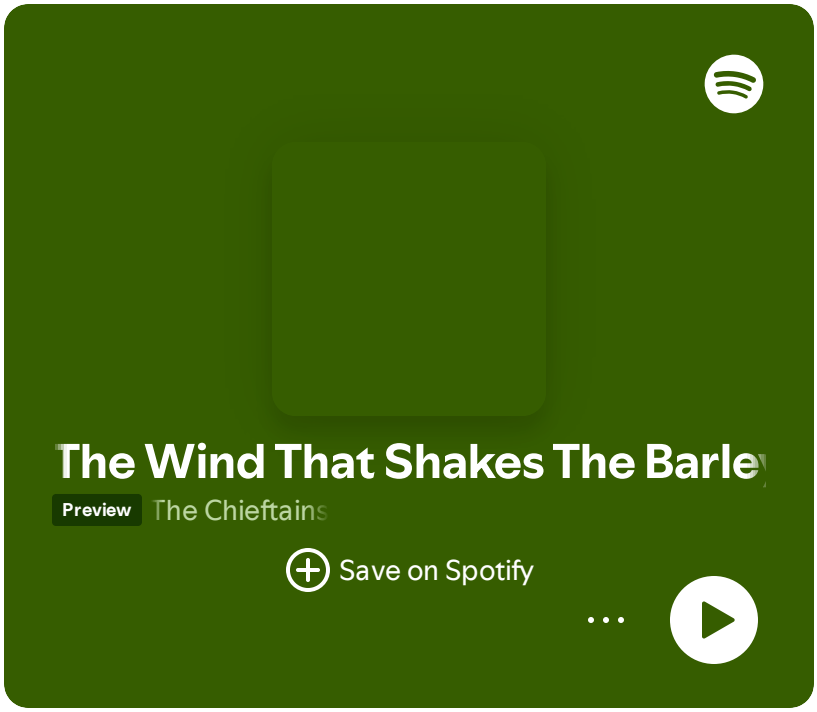
A **heterophonic** texture is characterized by multiple variations of the same melodic line that are heard simultaneously across different voices. These variations can range from small **embellishing tones** to longer runs in a single voice, as long as the melodic material stays relatively constant.

Listen to "Ana Hasreti" (2001) by Göskel Baktagir, an example of Turkish classical music. Notice how the winds embellish the melody presented by the plucked strings. While the instruments play different embellishments, they present essentially the same melodic material.



Example 3. *"Ana Hasreti" (2001) by Göskel Baktagir.*

Now listen to the traditional Irish reel "The Wind That Shakes the Barley," recorded by the Chieftains in 1978 (beginning at 0:50), and notice the slight variation between the melodic lines of the fiddle (violin) and the flute. This slight variation between the violin and flute presents a second example of heterophony.



Example 4. *"The Wind That Shakes The Barley/The Reel With The Beryle" by The Chieftains; listen starting at 0:50.*

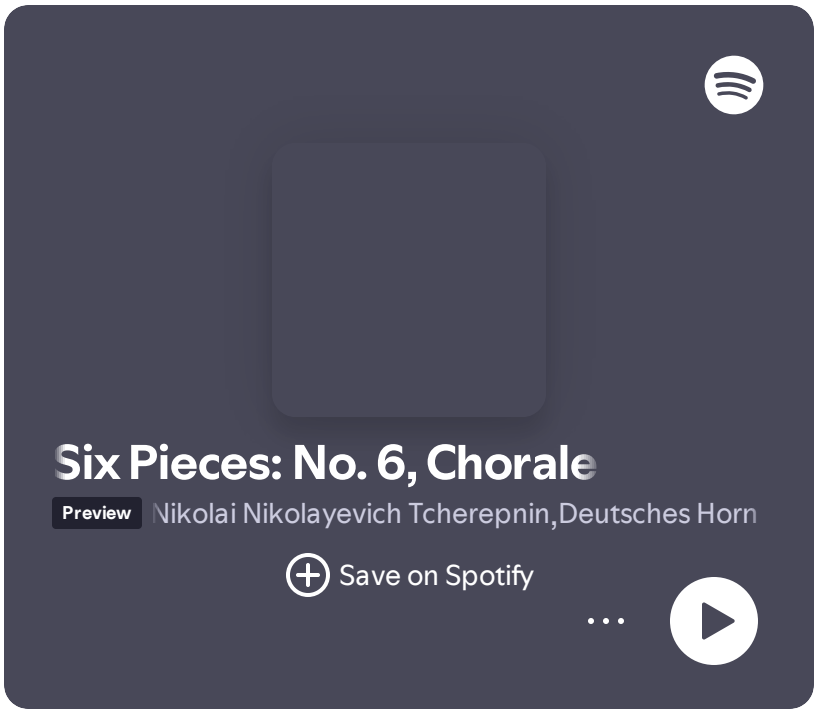
Homophony

A **homophonic** texture is characterized by having multiple voices moving together harmonically at the same pace. This is a very common texture. Many times, this takes the form of having a single melody that predominates, while other voices are used to fill out the harmonies. Homophony is sometimes further divided into two subcategories, **homorhythm** and **melody and accompaniment**.

Homorhythm

Homorhythm is a type of homophonic texture in which all voices move in an extremely similar or completely unison rhythm. This is most often seen in chorale-like compositions, where the melody and harmonies move together in **block chords**.

Let's listen to Six Horn Quartets: no. 6, Chorale (1910), written by Nikolai Tcherepnin. Notice how both the melody and harmony move mostly in block chords, creating a unified rhythm.



Example 5. *Six Horn Quartets: no 6, Chorale by Nikolai Tcherepnin, performed by the Deutsches Horn Ensemble.*

Now let's listen to the folk song "Wild Mountain Thyme" recorded by The Longest Johns in 2018 (0:20–0:44). Remember that in a homorhythmic texture, there is a similarity of rhythm throughout all of the voices. In this example, there is a melody that stands out from the texture, but the voices still move in rhythmic unison.

Example 6. *"Wild Mountain Thyme," by The Longest Johns; listen from 0:20–0:44.*

Melody and Accompaniment

A **melody and accompaniment** texture is perhaps the most common type of homophony. This texture is characterized by a clear melody that is distinct from other supporting voices, which are called an accompaniment. Often the melody will have a different

rhythm from the supporting voice(s).

Let's listen to the second movement of Paul Hindemith's Flute Sonata (1936). This example features a very clear melody (flute) and accompaniment (piano). Notice how the piano is never completely in rhythmic unison with the flute; however, it provides the role of accompaniment by filling out the texture harmonically.

Example 7. *Flute Sonata by Paul Hindemith, performed by Emmanuel Pahud and Eric Le Sage.*

Now let's listen to "Misty" (1954), written by Erroll Garner and performed by Ella Fitzgerald. Notice how the piano accompanies the primary melody sung by Fitzgerald (the vocalist).

Example 8. *"Misty" (1954), written by Erroll Garner and performed by Ella Fitzgerald.*

Polyphony

Polyphony is characterized by multiple voices with separate melodic lines and rhythms. In other words, each voice has its own independent melodic line, and the independent voices blend together to create harmonies.

In Western classical music, polyphony is commonly heard in fugues, such as Fugue no. 5 in D Major (1951–1952), written by Dmitri Shostakovich. Notice how each individual melodic line is independent, yet the voices create harmonies overall when heard together.

Example 9. *Fugue no. 5 in D Major by Dmitri Shostakovich, performed by Joachim Kwetzinsky.*

This can also be heard in the final chorus of "I'll Cover You – Reprise" from the Broadway musical *Rent* (1996), written by Jonathan Larson (2:20–2:45). Notice how there are three independent vocal layers, singing different melodies and rhythms, but working together to create new harmonies overall:

Example 10. *"I'll Cover You – Reprise" from the Broadway musical Rent (1996), written by Jonathan Larson; listen from 2:20–2:45.*

Most musical works have some variety in texture. For example, you may have heard a work that opened with a solo voice or instrument, then changed to a melody with accompaniment. There are many different possibilities!

Online Resources

- Terms That Describe Texture (Lumen)
- Texture in Music (Hello Music Theory)
- Texture in Music (learnmusictheory.net)
- Texture (Emory University)
- Texture (Robert Hutchinson)
- Texture (Phillip Magnuson)
- Four Types of Texture in Music (perennialmusicandarts.com)

Assignments from the Internet

A. Interactive Musical Textures Worksheet (website, website)
B. Study Guide to Texture and Worksheet (.pdf)
C. Texture: Homophonic or Polyphonic? (website)
D. Texture Composition Assignment, pp. 17–22 (.pdf)

Assignments

1. Identifying Textures (.pdf, .docx) Worksheet playlist

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    - 1.2: Notation of Notes, Clefs, and Ledger Lines - *Undeclared*
    - 1.3: Reading Clefs - *Undeclared*
    - 1.4: The Keyboard and the Grand Staff - *Undeclared*
    - 1.5: Half Steps, Whole Steps, and Accidentals - *Undeclared*
    - 1.6: American Standard Pitch Notation (ASPN) - *Undeclared*
    - 1.7: Other Aspects of Notation - *Undeclared*
  - 2: Unit 2- Basics of Rhtythm - *Undeclared*
    - 2.1: Rhythmic and Rest Values - *Undeclared*
    - 2.2: Simple Meter and Time Signatures - *Undeclared*
    - 2.3: Compound Meter and Time Signatures - *Undeclared*
    - 2.4: Other Rhythmic Essentials - *Undeclared*
  - 3: Unit 3- Scales - *Undeclared*
    - 3.1: Major Scales, Scale Degrees, and Key Signatures - *Undeclared*
    - 3.2: Minor Scales, Scale Degrees, and Key Signatures - *Undeclared*
    - 3.3: Introduction to Diatonic Modes and the Chromatic “Scale” - *Undeclared*
  - 4: Unit 4- Intervals - *Undeclared*
  - 5: Unit 5- Triads - *Undeclared*
  - 6: Unit 6- Seventh Chords - *Undeclared*
  - 7: Unit 7- Basics of Sight-singing and Dictation - *Undeclared*
  - 8: Unit 8- Inversion and Figured Bass - *Undeclared*
  - 9: Unit 9- Advanced Topics - *Undeclared*
    - 9.1: Roman Numerals and SATB Chord Construction - *Undeclared*
    - 9.2: Texture - *Undeclared*
  - Back Matter - *Undeclared*
    - Index - *Undeclared*
    - Glossary - *Undeclared*
    - Detailed Licensing - *Undeclared*
    - Detailed Licensing - *Undeclared*

Detailed Licensing

Overview

Title: Open Music Theory - Fundamentals

Webpages: 36

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By Page

- Open Music Theory - Fundamentals - *Undeclared*
  - Front Matter - *Undeclared*
    - TitlePage - *Undeclared*
    - InfoPage - *Undeclared*
    - Table of Contents - *Undeclared*
    - Licensing - *Undeclared*
  - 1: Unit 1- Intervals - *Undeclared*
    - 1.1: Introduction to Western Musical Notation - *Undeclared*
    - 1.2: Notation of Notes, Clefs, and Ledger Lines - *Undeclared*
    - 1.3: Reading Clefs - *Undeclared*
    - 1.4: The Keyboard and the Grand Staff - *Undeclared*
    - 1.5: Half Steps, Whole Steps, and Accidentals - *Undeclared*
    - 1.6: American Standard Pitch Notation (ASPN) - *Undeclared*
    - 1.7: Other Aspects of Notation - *Undeclared*
  - 2: Unit 2- Basics of Rhtythm - *Undeclared*
    - 2.1: Rhythmic and Rest Values - *Undeclared*
    - 2.2: Simple Meter and Time Signatures - *Undeclared*
    - 2.3: Compound Meter and Time Signatures - *Undeclared*
    - 2.4: Other Rhythmic Essentials - *Undeclared*
  - 3: Unit 3- Scales - *Undeclared*
    - 3.1: Major Scales, Scale Degrees, and Key Signatures - *Undeclared*
    - 3.2: Minor Scales, Scale Degrees, and Key Signatures - *Undeclared*
    - 3.3: Introduction to Diatonic Modes and the Chromatic “Scale” - *Undeclared*
  - 4: Unit 4- Intervals - *Undeclared*
  - 5: Unit 5- Triads - *Undeclared*
  - 6: Unit 6- Seventh Chords - *Undeclared*
  - 7: Unit 7- Basics of Sight-singing and Dictation - *Undeclared*
  - 8: Unit 8- Inversion and Figured Bass - *Undeclared*
  - 9: Unit 9- Advanced Topics - *Undeclared*
    - 9.1: Roman Numerals and SATB Chord Construction - *Undeclared*
    - 9.2: Texture - *Undeclared*
  - Back Matter - *Undeclared*
    - Index - *Undeclared*
    - Glossary - *Undeclared*
    - Detailed Licensing - *Undeclared*
    - Detailed Licensing - *Undeclared*