# Music Fundamentals 2: Rhythm and Meter

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# Music Fundamentals 2: Rhythm and Meter

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**C O N N E X I O N S**

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# Chapter 1

# Duration: Note Lengths in Written Music[1]

## 1.1 The Shape of a Note

In standard notation, a single musical sound is written as a **note**. The two most important things a written piece of music needs to tell you about a note are its pitch - how high or low it is - and its **duration** - how long it lasts.

To find out the pitch[2] of a written note, you look at the clef[3] and the key signature[4], then see what line or space the note is on. The higher a note sits on the staff[5], the higher it sounds. To find out the duration of the written note, you look at the tempo (Chapter 11) and the time signature (Chapter 5) and then see what the note looks like.

**The Parts of a Note**

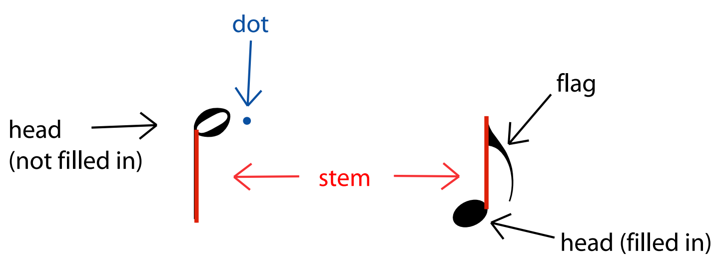


**Figure 1.1:** All of the parts of a written note affect how long it lasts.

The pitch of the note depends only on what line or space the **head** of the note is on. (Please see pitch[6]

[1]This content is available online at <http://cnx.org/content/m10945/2.14/>.
[2]"Pitch: Sharp, Flat, and Natural Notes" <http://cnx.org/content/m10943/latest/>
[3]"Clef" <http://cnx.org/content/m10941/latest/>
[4]"Key Signature" <http://cnx.org/content/m10881/latest/>
[5]"The Staff" <http://cnx.org/content/m10880/latest/>
[6]"Pitch: Sharp, Flat, and Natural Notes" <http://cnx.org/content/m10943/latest/>

, clef[7] and key signature[8] for more information.) If the note does not have a head (see Figure 1.2 (Notes Without Heads)), that means that it does not have one definite pitch.

**Notes Without Heads**

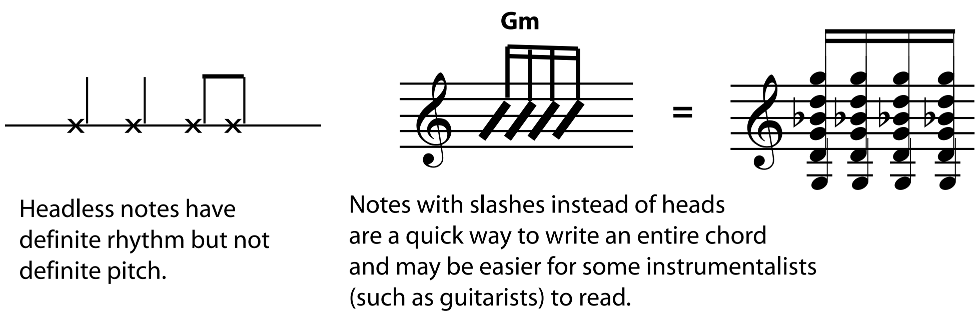


**Figure 1.2:** If a note does not have head, it does not have one definite pitch. Such a note may be a pitchless sound, like a drum beat or a hand clap, or it may be an entire chord rather than a single note.

The head of the note may be filled in (black), or not. The note may also have (or not) a stem, one or more flags, beams connecting it to other notes, or one or more dots following the head of the note. All of these things affect how much time the note is given in the music.

NOTE: A dot that is someplace other than next to the head of the note **does not affect the rhythm**. Other dots are articulation[9] marks. They may affect the actual length of the note (the amount of time it sounds), but do not affect the amount of time it must be given. (The extra time when the note could be sounding, but isn't, becomes an unwritten rest (Chapter 2).) If this is confusing, please see the explanation in articulation[10].

[7]"Clef" <http://cnx.org/content/m10941/latest/>
[8]"Key Signature" <http://cnx.org/content/m10881/latest/>
[9]"Articulation" <http://cnx.org/content/m11884/latest/>
[10]"Articulation" <http://cnx.org/content/m11884/latest/>

## 1.2 The Length of a Note

**Most Common Note Lengths**

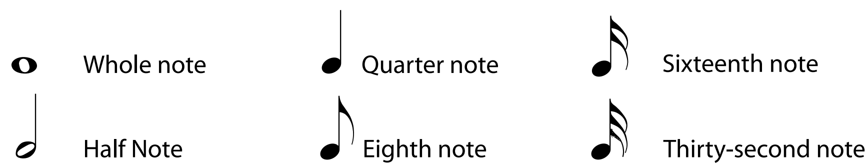


**Figure 1.3**

The simplest-looking note, with no stems or flags, is a **whole note**. All other note lengths are defined by how long they last compared to a whole note. A note that lasts half as long as a whole note is a **half note**. A note that lasts a quarter as long as a whole note is a **quarter note**. The pattern continues with **eighth notes**, **sixteenth notes**, **thirty-second notes**, **sixty-fourth notes**, and so on, each type of note being half the length of the previous type. (There are no such thing as third notes, sixth notes, tenth notes, etc.; see Dots, Ties, and Borrowed Divisions (Chapter 3) to find out how notes of unusual lengths are written.)

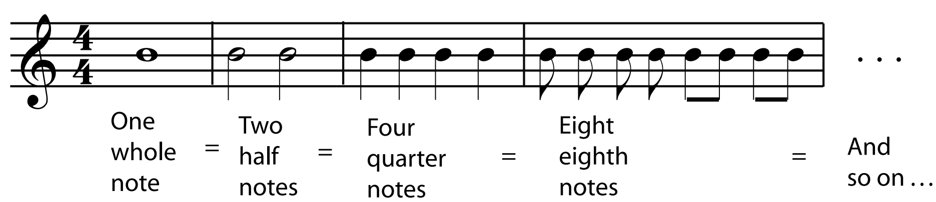


**Figure 1.4:** Note lengths work just like fractions in arithmetic: two half notes or four quarter notes last the same amount of time as one whole note. Flags are often replaced by beams that connect the notes into easy-to-read groups.

You may have noticed that some of the eighth notes in Figure 1.4 don't have flags; instead they have a **beam** connecting them to another eighth note. If flagged notes are next to each other, their flags can be replaced by beams that connect the notes into easy-to-read groups. The beams may connect notes that are all in the same beat, or, in some vocal music, they may connect notes that are sung on the same text syllable. Each note will have the same number of beams as it would have flags.

**Notes with Beams**

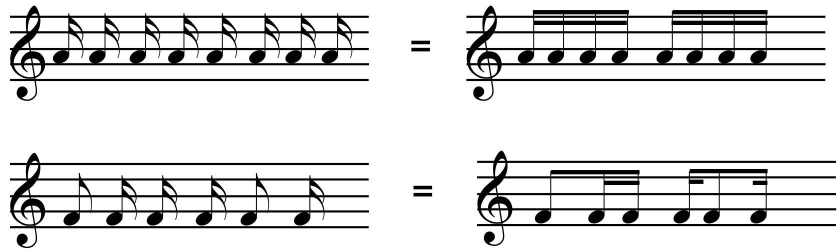

**Figure 1.5:** The notes connected with beams are easier to read quickly than the flagged notes. Notice that each note has the same number of beams as it would have flags, even if it is connected to a different type of note. The notes are often (but not always) connected so that each beamed group gets one beat. This makes the notes easier to read quickly.

You may have also noticed that the note lengths sound like fractions in arithmetic. In fact they work very much like fractions: two half notes will be equal to (last as long as) one whole note; four eighth notes will be the same length as one half note; and so on. (For classroom activities relating music to fractions, see Fractions, Multiples, Beats, and Measures[11].)

**Example 1.1**

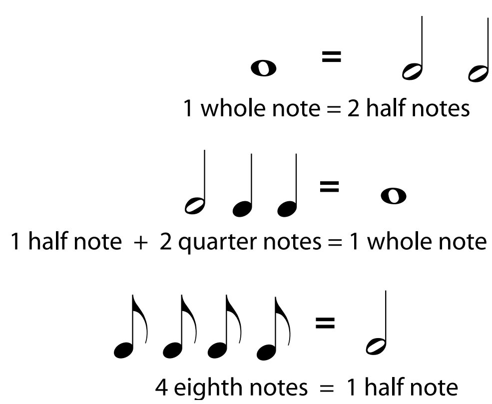


**Figure 1.6**

**Exercise 1.1** ***(Solution on p. 7.)***

Draw the missing notes and fill in the blanks to make each side the same duration (length of time).

[11]"Fractions, Multiples, Beats, and Measures" <http://cnx.org/content/m11807/latest/>

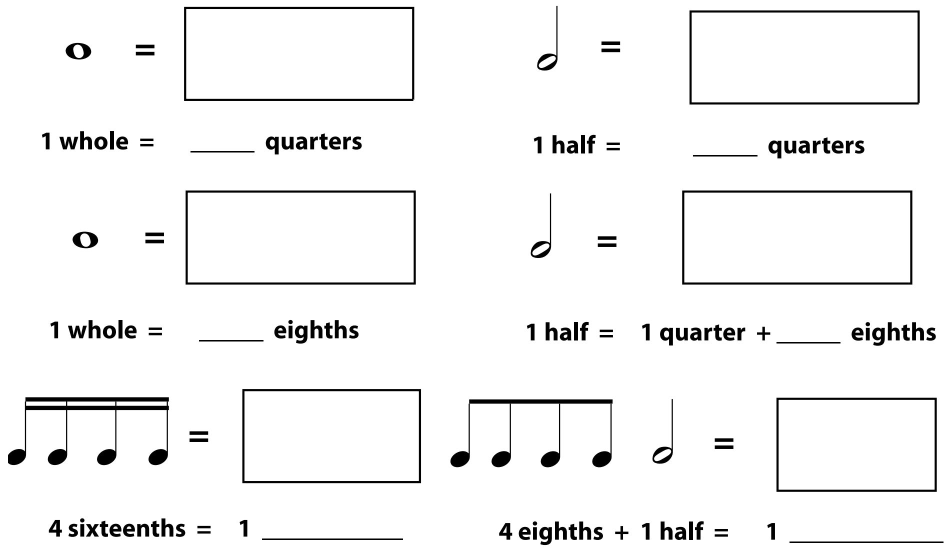


**Figure 1.7**

So how long does each of these notes actually last? That depends on a couple of things. A written note lasts for a certain amount of time measured in beats (Section 5.1: Beats and Measures). To find out exactly how many beats it takes, you must know the time signature (Chapter 5). And to find out how long a beat is, you need to know the tempo (Chapter 11).

**Example 1.2**

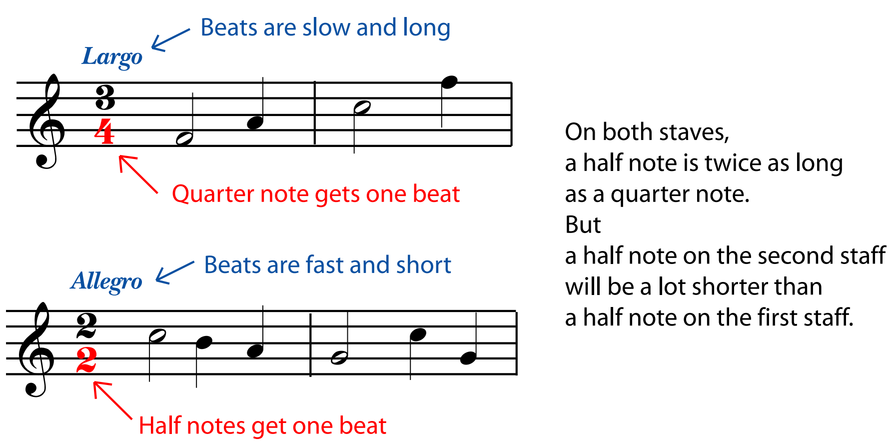


**Figure 1.8:** In any particular section of a piece of music, a half note is always twice as long as a quarter note. But how long each note actually lasts depends on the time signature and the tempo.

## 1.3 More about Stems

Whether a stem points up or down does not affect the note length at all. There are two basic ideas that lead to the rules for stem direction. One is that the music should be as easy as possible to read and understand. The other is that the notes should tend to be "in the staff" as much as reasonably possible.

**Basic Stem Direction Rules**

1. **Single Notes** - Notes below the middle line of the staff should be stem up. Notes on or above the middle line should be stem down.
2. **Notes sharing a stem (block chords)** - Generally, the stem direction will be the direction for the note that is furthest away from the middle line of the staff
3. **Notes sharing a beam** - Again, generally you will want to use the stem direction of the note farthest from the center of the staff, to keep the beam near the staff.
4. **Different rhythms being played at the same time by the same player** - Clarity requires that you write one rhythm with stems up and the other stems down.
5. **Two parts for different performers written on the same staff** - If the parts have the same rhythm, they may be written as block chords. If they do not, the stems for one part (the "high" part or "first" part) will point up and the stems for the other part will point down. This rule is especially important when the two parts cross; otherwise there is no way for the performers to know that the "low" part should be reading the high note at that spot.

**Stem Direction**

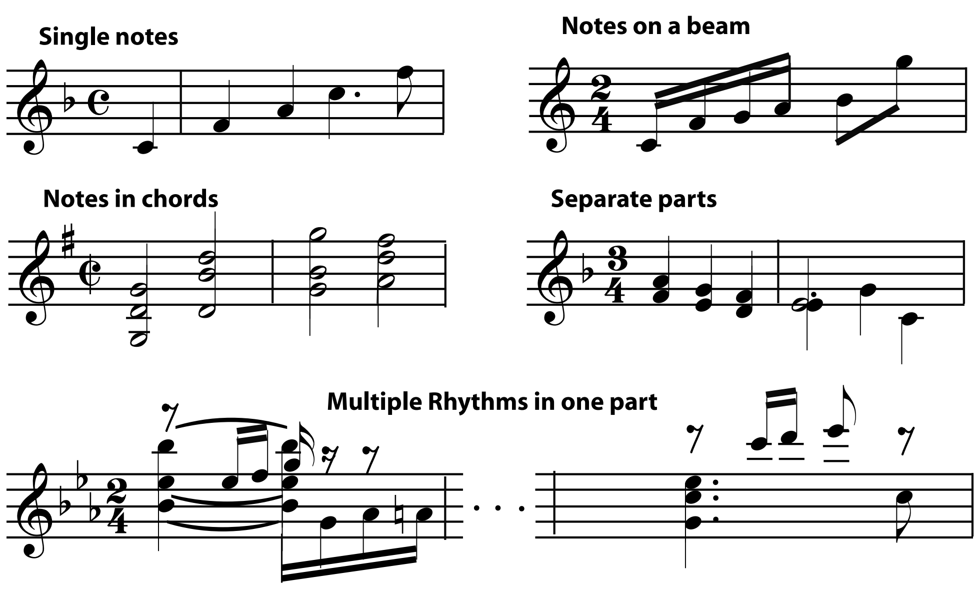


**Figure 1.9:** Keep stems and beams in or near the staff, but also use stem direction to clarify rhythms and parts when necessary.

# Solutions to Exercises in Chapter 1

### Solution to Exercise 1.1 (p. 4)

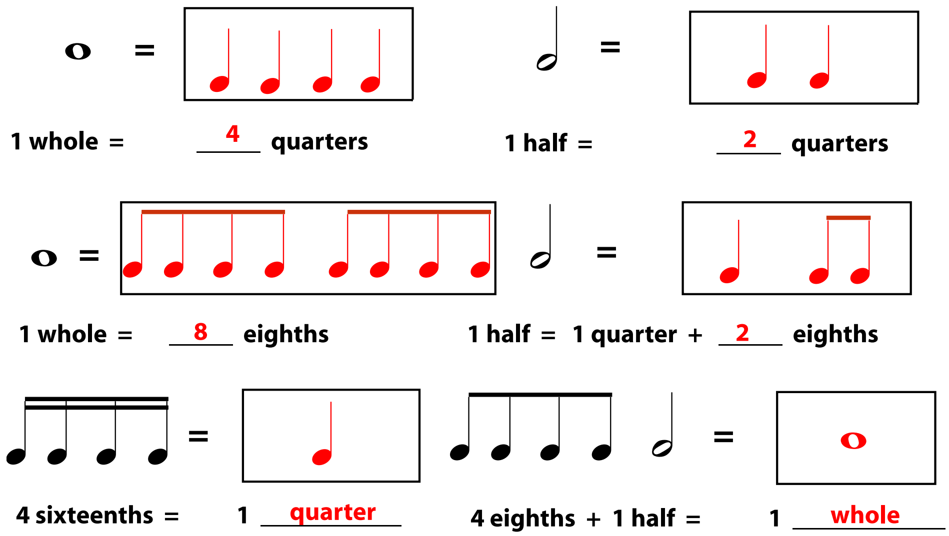


**Figure 1.10**

# Chapter 2

# Duration: Rest Length[1]

A **rest** stands for a silence in music. For each kind of note (Chapter 1), there is a written rest of the same length.

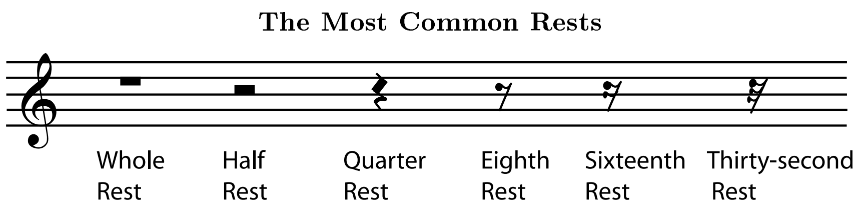


**Figure 2.1**

**Exercise 2.1** ***(Solution on p. 12.)***

For each note on the first line, write a rest of the same length on the second line. The first measure (Section 5.1: Beats and Measures) is done for you.

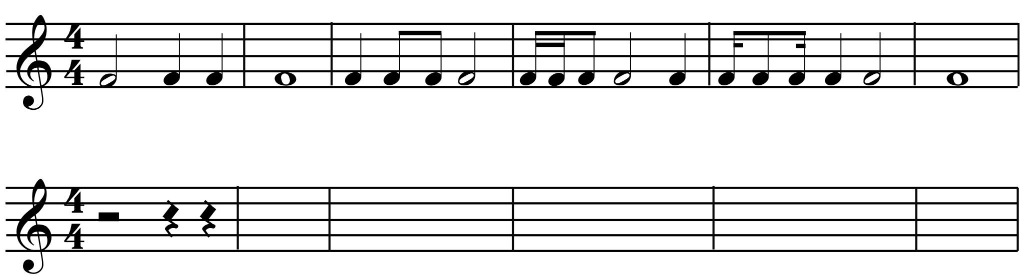

**Figure 2.2**

Rests don't necessarily mean that there is silence in the music at that point; only that that part is silent.

[1]This content is available online at <http://cnx.org/content/m11887/1.9/>.

Often, on a staff[2] with multiple parts, a rest must be used as a placeholder for one of the parts, even if a single person is playing both parts. When the rhythms are complex, this is necessary to make the rhythm in each part clear.

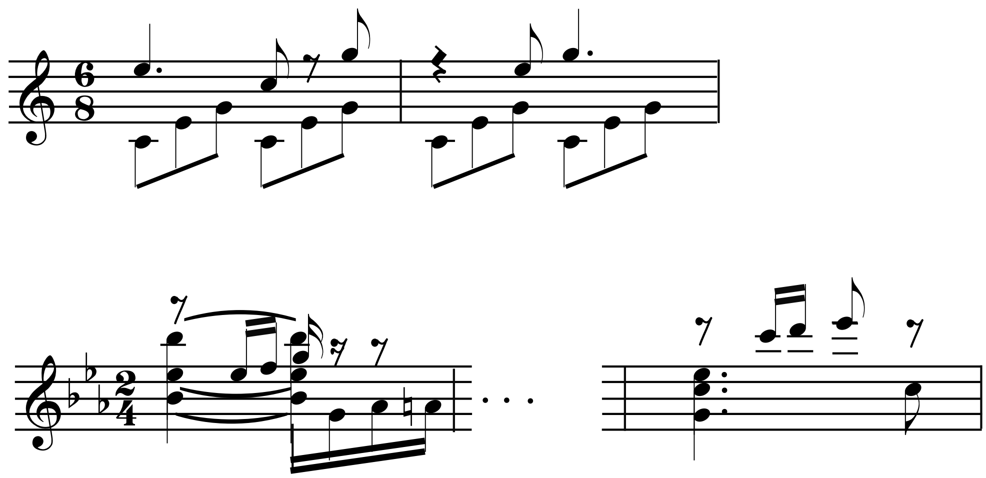

**Figure 2.3:** When multiple simultaneous rhythms are written on the same staff, rests may be used to clarify individual rhythms, even if another rhythm contains notes at that point.

The normal rule in common notation is that, for any line of music, the notes and rests in each measure must "add up" to exactly the amount in the time signature (Chapter 5), no more and no less. For example, in 3/4 time, a measure can have any combination of notes and rests that is the same length as three quarter notes. There is only one common exception to this rule. As a simplifying shorthand, a completely silent measure can simply have a whole rest. In this case, "whole rest" does not necessarily mean "rest for the same length of time as a whole note"; it means "rest for the entire measure".

[2]"The Staff" <http://cnx.org/content/m10880/latest/>

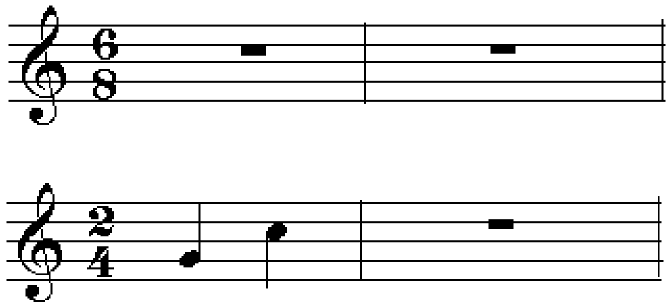

**Figure 2.4:** A whole rest may be used to indicate a completely silent measure, no matter what the actual length of the measure will be.

## Solutions to Exercises in Chapter 2

**Solution to Exercise 2.1 (p. 9)**

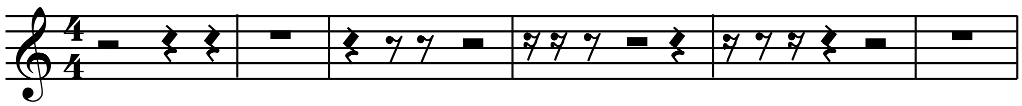

**Figure 2.5**

# Chapter 3

# Dots, Ties, and Borrowed Divisions[1]

A half note is half the length of a whole note; a quarter note is half the length of a half note; an eighth note is half the length of a quarter note, and so on. (See Duration:Note Length (Chapter 1).) The same goes for rests. (See Duration: Rest Length (Chapter 2).) But what if you want a note (or rest) length that isn't half of another note (or rest) length?

## 3.1 Dotted Notes

One way to get a different length is by dotting the note or rest. A **dotted note** is one-and-a-half times the length of the same note without the dot. In other words, the note keeps its original length and adds another half of that original length because of the dot. So a dotted half note, for example, would last as long as a half note plus a quarter note, or three quarters of a whole note.

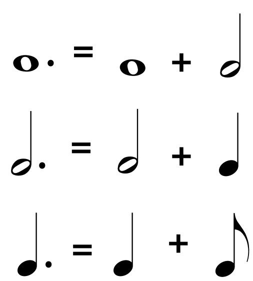

**Figure 3.1:** The dot acts as if it is adding another note half the length of the original note. A dotted quarter note, for example, would be the length of a quarter plus an eighth, because an eighth note is half the length of a quarter note.

**Exercise 3.1** *(Solution on p. 18.)*

Make groups of equal length on each side, by putting a dotted note or rest in the box.

[1]This content is available online at <http://cnx.org/content/m11888/1.10/>.

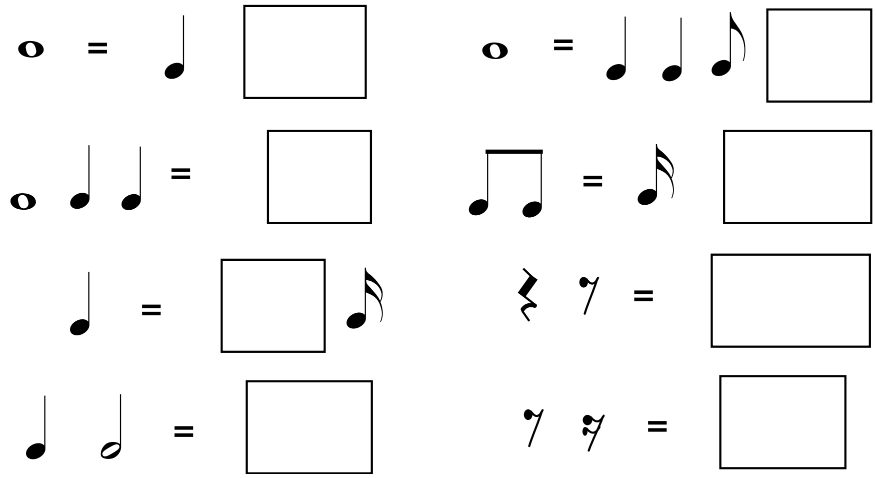

**Figure 3.2**

A note may have more than one dot. Each dot adds half the length that the dot before it added. For example, the first dot after a half note adds a quarter note length; the second dot would add an eighth note length.

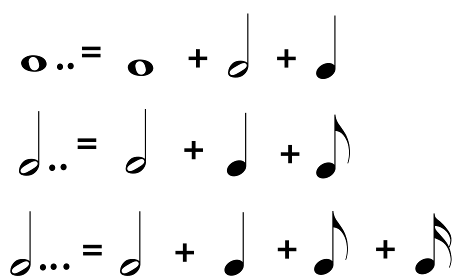

**Figure 3.3:** When a note has more than one dot, each dot is worth half of the dot before it.

## 3.2 Tied Notes

A dotted half lasts as long as a half note plus a quarter note. The same length may be written as a half note and a quarter note tied together. **Tied notes** are written with a curved line connecting two notes that are on the same line or the same space in the staff. Notes of any length may be tied together, and more than two notes may be tied together. **The sound they stand for will be a single note that is the length of all the tied notes added together.** This is another way to make a great variety of note lengths. Tied notes are also the only way to write a sound that starts in one measure (Section 5.1: Beats and Measures) and ends in a different measure.

NOTE: Ties may look like slurs[2], but they are not the same; a slur connects to notes with different pitches[3] and is a type of articulation[4].

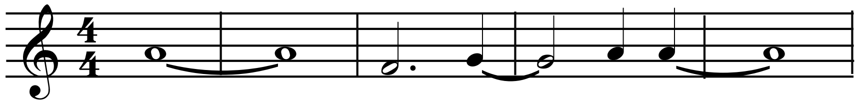

**Figure 3.4:** When these eight notes are played as written, only five distinct notes are heard: one note the length of two whole notes; then a dotted half note; then another note the same length as the dotted half note; then a quarter note; then a note the same length as a whole note plus a quarter note.

## 3.3 Borrowed Divisions

Dots and ties give you much freedom to write notes of varying lengths, but so far you must build your notes from halves of other notes. If you want to divide a note length into anything other than halves or halves of halves - if you want to divide a beat into thirds or fifths, for example - you must write the number of the division over the notes. These unusual subdivisions are called **borrowed divisions** because they sound as if they have been borrowed from a completely different meter (Chapter 8). They can be difficult to perform correctly and are avoided in music for beginners. The only one that is commonly used is **triplets**, which divide a note length into equal thirds.

[2]"Articulation" <http://cnx.org/content/m11884/latest/#p1d>
[3]"Pitch: Sharp, Flat, and Natural Notes" <http://cnx.org/content/m10943/latest/>
[4]"Articulation" <http://cnx.org/content/m11884/latest/>

**Some Borrowed Divisions**

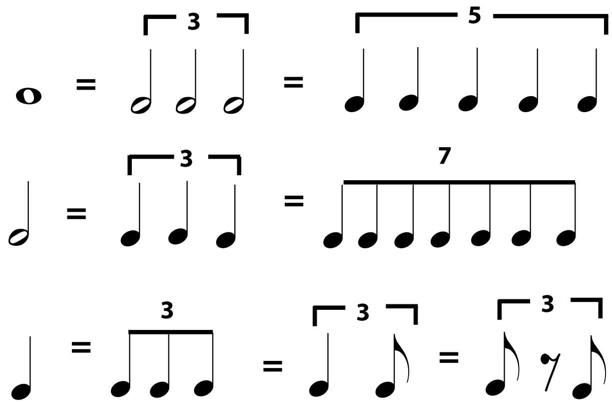


**Figure 3.5:** Any common note length can be divided into an unusual number of equal-length notes and rests, for example by dividing a whole note into three instead of two "half" notes. The notes are labeled with the appropriate number. If there might be any question as to which notes are involved in the borrowed division, a bracket is placed above them. Triplets are by far the most common borrowed division.

**Borrowed Duplets**

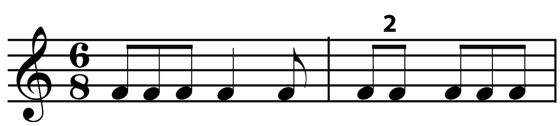


**Figure 3.6:** In a compound meter (Chapter 8), which normally divides a beat into three, the borrowed division may divide the beat into two, as in a simple meter. You may also see duplets in swing music.

Notes in jazzy-sounding music that has a "swing" beat are often assumed to be triplet rhythms, even when they look like regular divisions; for example, two written eighth notes (or a dotted quarter-sixteenth) might sound like a triplet quarter-eighth rhythm. In jazz and other popular music styles, a tempo (Chapter 11) notation that says **swing** usually means that all rhythms should be played as triplets. **Straight** means to play the rhythms as written.

> NOTE: Some jazz musicians prefer to think of a swing rhythm as more of a heavy accent on the second eighth, rather than as a triplet rhythm, particularly when the tempo (Chapter 11) is fast. This distinction is not important for students of music theory, but jazz students will want to work hard on using both rhythm (Chapter 4) and articulation[5] to produce a convincing "swing".

[5]"Articulation" <http://cnx.org/content/m11884/latest/>

**Swing Rhythms**

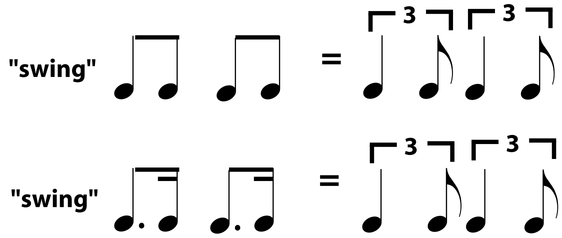


**Figure 3.7:** Jazz or blues with a **"swing" rhythm** often assumes that all divisions are triplets. The swung triplets may be written as triplets, or they may simply be written as "straight" eighth notes or dotted eighth-sixteenths. If rhythms are not written as triplets, the tempo marking usually includes an indication to "swing", or it may simply be implied by the style and genre of the music.

## Solutions to Exercises in Chapter 3

### Solution to Exercise 3.1 (p. 13)

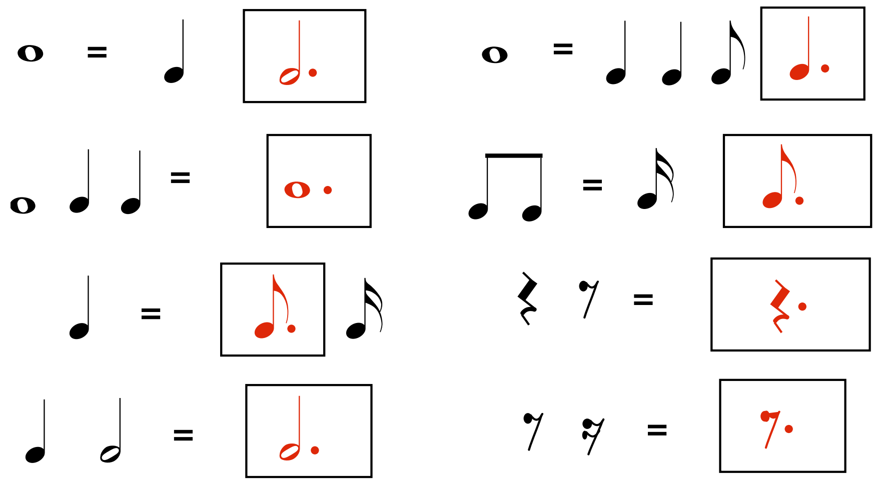

**Figure 3.8**

# Chapter 4

# Rhythm[1]

Rhythm, melody[2], harmony[3], timbre[4], and texture[5] are the essential aspects of a musical performance. They are often called the basic elements of music. The main purpose of music theory is to describe various pieces of music in terms of their similarities and differences in these elements, and music is usually grouped into genres based on similarities in all or most elements. It's useful, therefore, to be familiar with the terms commonly used to describe each element. Because harmony is the most highly developed aspect of Western music[6], music theory tends to focus almost exclusively on melody and harmony. Music does not have to have harmony, however, and some music doesn't even have melody. So perhaps the other three elements can be considered the most basic components of music.

Music cannot happen without time. The placement of the sounds in time is the rhythm of a piece of music. Because music must be heard over a period of time, rhythm is one of the most basic elements of music. In some pieces of music, the rhythm is simply a "placement in time" that cannot be assigned a beat (Section 5.1: Beats and Measures) or meter (Chapter 8), but most rhythm terms concern more familiar types of music with a steady beat. See Meter (Chapter 8) for more on how such music is organized, and Duration (Chapter 1) and Time Signature (Chapter 5) for more on how to read and write rhythms. See Simple Rhythm Activities[7] for easy ways to encourage children to explore rhythm.

**Rhythm Terms**

- **Rhythm** - The term "rhythm" has more than one meaning. It can mean the basic, repetitive pulse of the music, or a rhythmic pattern that is repeated throughout the music (as in "feel the rhythm"). It can also refer to the pattern in time of a single small group of notes (as in "play this rhythm for me").
- **Beat** - Beat also has more than one meaning, but always refers to music with a steady pulse. It may refer to the pulse itself (as in "play this note on beat two of the measure (Section 5.1: Beats and Measures)"). **On the beat** or **on the downbeat** refer to the moment when the pulse is strongest. **Off the beat** is in between pulses, and the **upbeat** is exactly halfway between pulses. **Beat** may also refer to a specific repetitive rhythmic pattern that maintains the pulse (as in "it has a Latin beat"). Note that once a strong feeling of having a beat is established, it is not necessary for something to happen on every beat; a beat can still be "felt" even if it is not specifically heard.
- **Measure or bar** - Beats are grouped into measures or bars. The first beat is usually the strongest, and in most music, most of the bars have the same number of beats. This sets up an underlying pattern in the pulse of the music: for example, strong-weak-strong-weak-strong-weak, or strong-weak-weak-strong-weak-weak. (See Meter (Chapter 8).)

[1]This content is available online at <http://cnx.org/content/m11646/1.8/>.
[2]"Melody" <http://cnx.org/content/m11647/latest/>
[3]"Harmony" <http://cnx.org/content/m11654/latest/>
[4]"Timbre: The Color of Music" <http://cnx.org/content/m11059/latest/>
[5]"The Textures of Music" <http://cnx.org/content/m11645/latest/>
[6]"What Kind of Music is That?" <http://cnx.org/content/m11421/latest/>
[7]"Simple Rhythm Activities" <http://cnx.org/content/m14258/latest/>

- **Rhythm Section** - The rhythm section of a band is the group of instruments that usually provide the background rhythm and chords. The rhythm section almost always includes a percussionist (usually on a drum set) and a bass player (usually playing a plucked string bass of some kind). It may also include a piano and/or other keyboard players, more percussionists, and one or more guitar players or other strummed or plucked strings. Vocalists, wind instruments, and bowed strings are usually not part of the rhythm section.
- **Syncopation** - Syncopation occurs when a strong note happens either on a weak beat or off the beat. See Syncopation[8].

[8]"Syncopation" <http://cnx.org/content/m11644/latest/>

# Chapter 5

# Time Signature[1]

In common notation[2], the **time signature** appears at the beginning of a piece of music, right after the key signature[3]. Unlike the key signature, which is on every staff[4], the time signature will not appear again in the music unless the meter changes. The meter (Chapter 8) of a piece is a repetitive rhythmic pulse that underlies the music. The time signature is the symbol that tells you what meter is being used in a piece of music and what types of note (Chapter 1)) are being used to write it out.

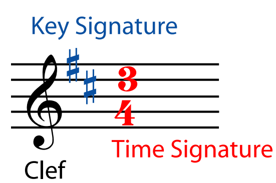


**Figure 5.1:** The time signature appears at the beginning of the piece of music, right after the clef symbol and key signature.

## 5.1 Beats and Measures

Music happens over a period of time, so a very common way to organize music is to divide that time into short periods of the same length, using audible pulses called **beats**. Each pulse is **a beat**, and the regular, predictable pulse of a piece of music is **the beat**. The beat is created when the musicians do things (like hit a drum, strum a guitar, or start singing a word) at very regular intervals. This creates an audible, predictable pulse that helps the musicians to coordinate what they are doing so that they sound good together. The predictability and audibility of the beat also allows others to join in. As soon as listeners can "feel the beat," they can clap hands, snap fingers, tap their feet, nod their heads, march, dance, or sing along "in time" with the music (in other words, coordinated with the musicians). Anything that happens during the audible pulse (a clap or drum hit, for example), as well as anything that starts during a pulse (such as a sung word, or a note on a flute or violin) is said to be **on the beat**. Of course, things can happen in between the beats,

[1] This content is available online at <http://cnx.org/content/m10956/2.15/>.
[2] "The Staff" <http://cnx.org/content/m10880/latest/>
[3] "Key Signature" <http://cnx.org/content/m10881/latest/>
[4] "The Staff" <http://cnx.org/content/m10880/latest/>

too, but the timing for those is also coordinated using the beats; for example, a note might begin at exactly the halfway point between two beats.

NOTE: Not all music has beats and a time signature. In music with a **free** rhythm or meter, there is no time signature, and no regular pulse to the music; the musicians are free to play or sing a note at whatever time they feel is best. Other pieces may have a written time signature, to help the musicians keep track of time, but the musical events in the piece do not give it an audible beat.

**Example 5.1**
Listen to excerpts A, B, C and D. Can you clap your hands, tap your feet, or otherwise move "to the beat"? Is there a piece in which it is easier or harder to feel the beat?

- A[5]
- B[6]
- C[7]
- D[8]

When music is organized into beats, it makes sense to write it down that way. In common notation[9], the composer assigns a particular kind of note to be one beat long. For example, if "a quarter note gets a beat," then playing many quarter notes in a row would mean playing a new note on every beat. The quarter note is most likely to play this role, but any type of note (Chapter 1) can get the "this is one beat" designation.

In most metered music, some of the beats are stronger (louder, more powerful, more noticeable, or busier), than others, and there is a regular pattern of stronger and weaker beats, for example, strong-weak-weak-strong-weak-weak, or strong-weak-strong-weak. So the beats are organized even further by grouping them into **bars**, or **measures**. (The two words mean the same thing.) For example, for music with a beat pattern of strong-weak-weak-strong-weak-weak, or 1-2-3-1-2-3, a measure would have three beats in it. The **time signature** tells you two things: how many beats there are in each measure, and what type of note (Chapter 1) gets a beat.

**Reading the Time Signature**

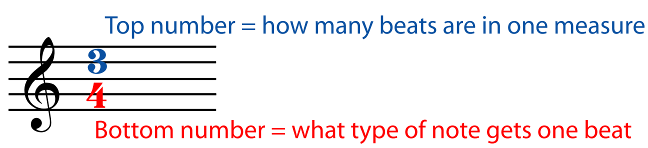


**Figure 5.2:** This time signature means that there are three quarter notes (or any combination of notes that equals three quarter notes) in every measure. A piece with this time signature would be "in three four time" or just "in three four".

**Exercise 5.1** *(Solution on p. 27.)*
Listen again to the music in Example 5.1. Instead of clapping, count each beat. Decide whether the music has 2, 3, or 4 beats per measure. In other words, does it feel more natural to count 1-2-1-2, 1-2-3-1-2-3, or 1-2-3-4-1-2-3-4?

[5]See the file at <http://cnx.org/content/m10956/latest/Tanz.mp3>
[6]See the file at <http://cnx.org/content/m10956/latest/EasyWinners.MID>
[7]See the file at <http://cnx.org/content/m10956/latest/Jetztkommt.MID>
[8]See the file at <http://cnx.org/content/m10956/latest/Greensleeves.mp3>
[9]"The Staff" <http://cnx.org/content/m10880/latest/>

## 5.2 Reading Time Signatures

Most time signatures contain two numbers. The top number tells you how many beats there are in a measure. The bottom number tells you what kind of note gets a beat.

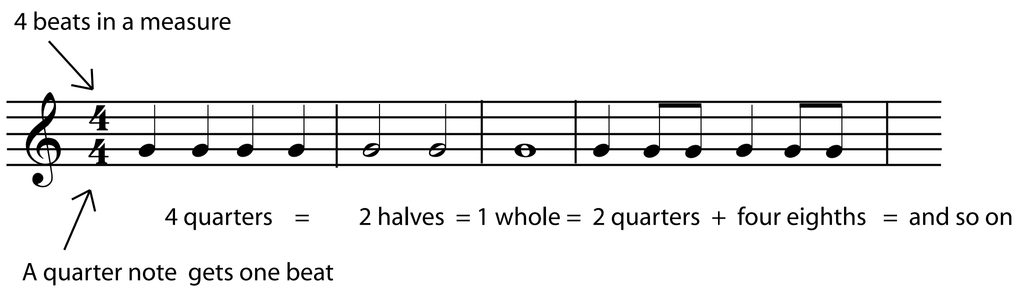


**Figure 5.3:** In "four four" time, there are four beats in a measure and a quarter note gets a beat. In order to keep the meter going steadily, every measure must have a combination of notes and rests that is equivalent to four quarter notes.

You may have noticed that the time signature looks a little like a fraction in arithmetic. Filling up measures feels a little like finding equivalent fractions[10], too. In "four four time", for example, there are four beats in a measure and a quarter note gets one beat. So four quarter notes would fill up one measure. But so would any other combination of notes and rests (Chapter 2) that equals four quarters: one whole, two halves, one half plus two quarters, a half note and a half rest, and so on.

**Example 5.2**
If the time signature is three eight, any combination of notes that adds up to three eighths will fill a measure. Remember that a dot (Chapter 3) is worth an extra half of the note it follows. Listen[11] to the rhythms in Figure 5.4.

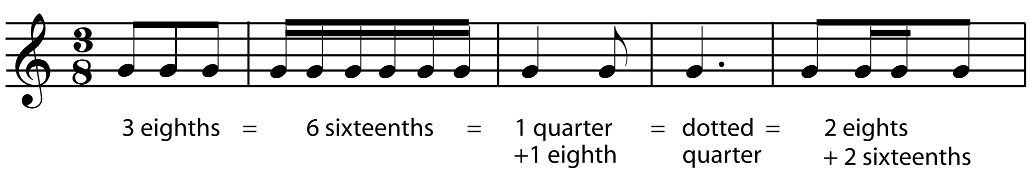


**Figure 5.4:** If the time signature is three eight, a measure may be filled with any combination of notes and rests that adds up to three eight.

**Exercise 5.2** ***(Solution on p. 27.)***
Write each of the time signatures below (with a clef symbol) at the beginning of a staff. Write at least four measures of music in each time signature. Fill each measure with a different combination

[10]"Fractions, Multiples, Beats, and Measures" <http://cnx.org/content/m11807/latest/>
[11]See the file at <http://cnx.org/content/m10956/latest/timesig1.MID>

of note lengths. Use at least one dotted note on each staff. If you need some staff paper, you can download this PDF file[12].

1. Two four time
2. Three eight time
3. Six four time

A few time signatures don't have to be written as numbers. Four four time is used so much that it is often called **common time**, written as a bold "C". When both fours are "cut" in half to twos, you have **cut time**, written as a "C" cut by a vertical slash.

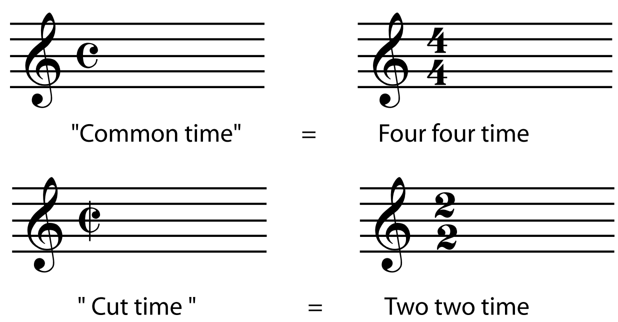


**Figure 5.5**

## 5.3 Counting and Conducting

You may have already noticed that a measure in four four time looks the same as a measure in two two. After all, in arithmetic, four quarters adds up to the same thing as two halves. For that matter, why not call the time signature "one one" or "eight eight"?

[12]See the file at <http://cnx.org/content/m10956/latest/staffpaper1.pdf>

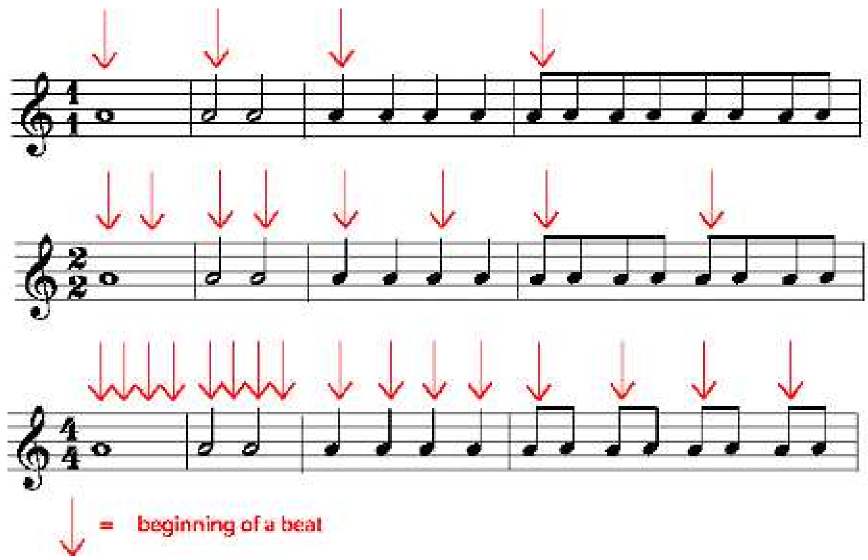


**Figure 5.6:** Measures in all of these meters look the same, but feel different. The difference is how many downbeats there are in a measure.

Or why not write two two as two four, giving quarter notes the beat instead of half notes? The music would look very different, but it would sound the same, as long as you made the beats the same speed. The music in each of the staves in Figure 5.7 would sound like this[13].

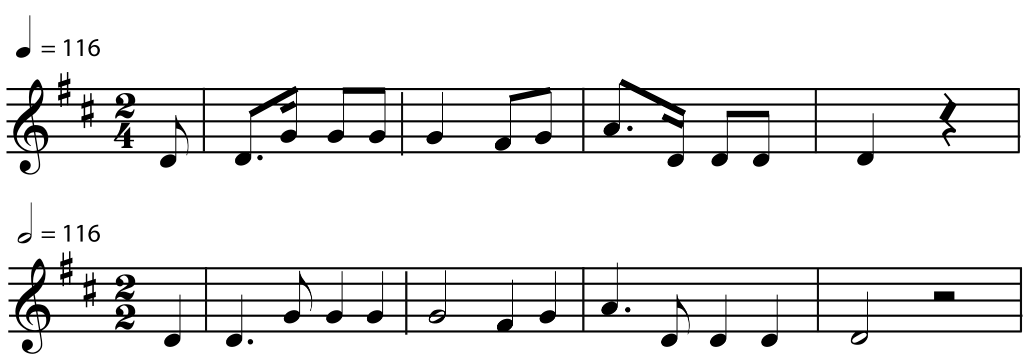


**Figure 5.7:** The music in each of these staves should sound exactly alike.

So why is one time signature chosen rather than another? The composer will normally choose a time signature that makes the music easy to read and also easy to count and conduct[14]. Does the music feel like

[13]See the file at <http://cnx.org/content/m10956/latest/14k.mid>
[14]"Conducting" <http://cnx.org/content/m12404/latest/>

it has four beats in every measure, or does it go by so quickly that you only have time to tap your foot twice in a measure?

A common exception to this rule of thumb is six eight time, and the other time signatures (for example nine eight and twelve eight) that are used to write compound meters (Chapter 8). A piece in six eight might have six beats in every measure, with an eighth note getting a beat. But it is more likely that the conductor (or a tapping foot) will give only two beats per measure, with a dotted quarter (or three eighth notes) getting one beat. In the same way, three eight may only have one beat per measure; nine eight, three beats per measure; and twelve eight, four beats per measure. Why the exceptions? Since beats normally get divided into halves and quarters, this is the easiest way for composers to write beats that are divided into thirds.

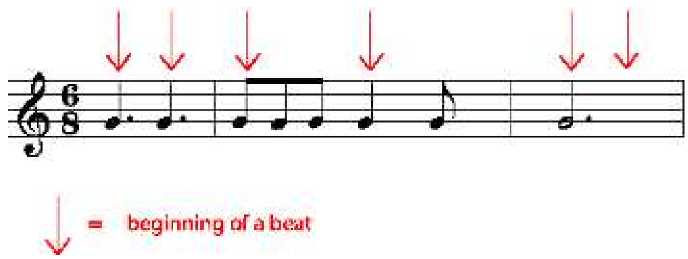


**Figure 5.8:** In six eight time, a dotted quarter usually gets one beat. This is the easiest way to write beats that are evenly divided into three rather than two.

## Solutions to Exercises in Chapter 5

**Solution to Exercise 5.1 (p. 22)**

- A has a very strong, quick 1-2-3 beat.
- B is in a slow (easy) 2. You may feel it in a fast 4.
- C is in a stately 4.
- D is in 3, but the beat may be harder to feel than in A because the rhythms are more complex and the performer is taking some liberties with the tempo (Chapter 11).

**Solution to Exercise 5.2 (p. 23)**

There are an enormous number of possible note combinations for any time signature. That's one of the things that makes music interesting. Here are some possibilities. If you are not sure that yours are correct, check with your music instructor.

**Figure 5.9:** These are only a few of the many, many possible note combinations that could be used in these time signatures.

# Chapter 6

# Introduction to Subdivisions in Simple Meters [1]

In general, we more accurately gauge shorter periods than longer periods of time. For instance, the difference between the length of whole notes performed at a quarter note = 60 and then at 66 would be difficult to discern. However, we can easily discern the difference between sixteenth notes performed at those speeds, four to a quarter-note beat. Our ability to perceive smaller increments of time can help us with the larger time spans. By accumulating many smaller time spans we can accurate measure or perceive the larger ones.

"Subdivision" or "subdividing" refers to dividing the beat, most often silently, into smaller units. Technically speaking divisions are note values that divide beats (in 4/4 and 6/8 they are eighth notes) and subdivisions are note values that further divide divisions (in 4/4 and 6/8 they are sixteenth notes). Informally, however, most performing musicians use the term subdivision to describe counting note values smaller than the beat. Usually these note values are eighth or sixteenth notes. The ability to subdivide while performing music ensures rhythmic accuracy and is an important skill that all musicians need to develop.

Simple meters (2/4, 3/4, 4/4 etc.) generally feature subdivisions of the beat in four parts. In the figure below please notice that the sixteenth notes form subdivisions of all of the larger value notes:

[1] This content is available online at <http://cnx.org/content/m22810/1.1/>.

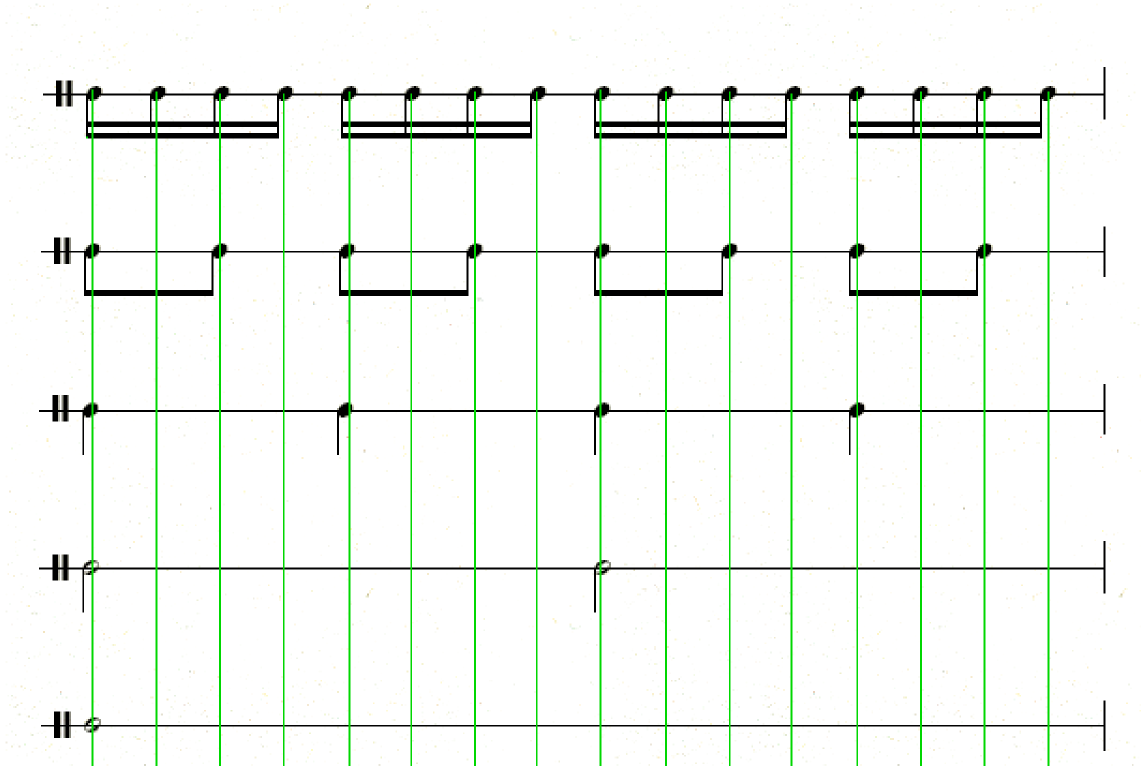

**Figure 6.1**

Below is an example with subdivisions: the upper part is aligned with sixteenth note subdivisions in the lower part:

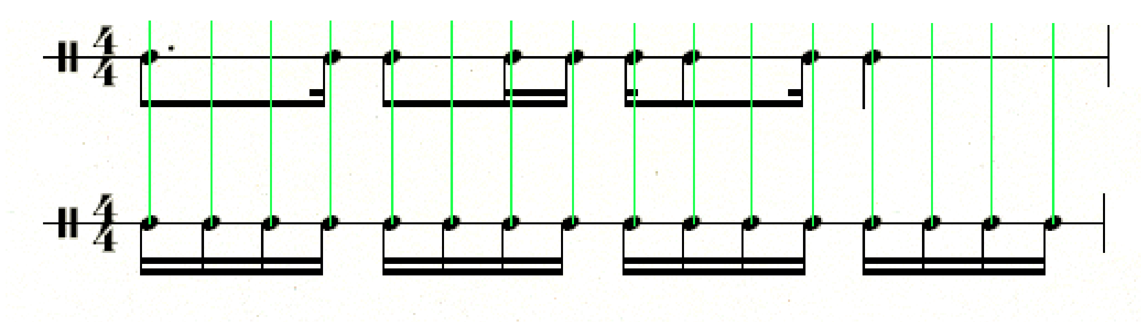

**Figure 6.2**

The first step to internalizing the subdivisions is to beat out a steady pattern of sixteenth notes while playing a melody line. For instance, while tapping 16th notes with a hand or foot try singing or saying the upper part with “ta” or “la” for each note. This may take a little bit of practice.

Try tapping out eighth notes while performing these simple patterns:

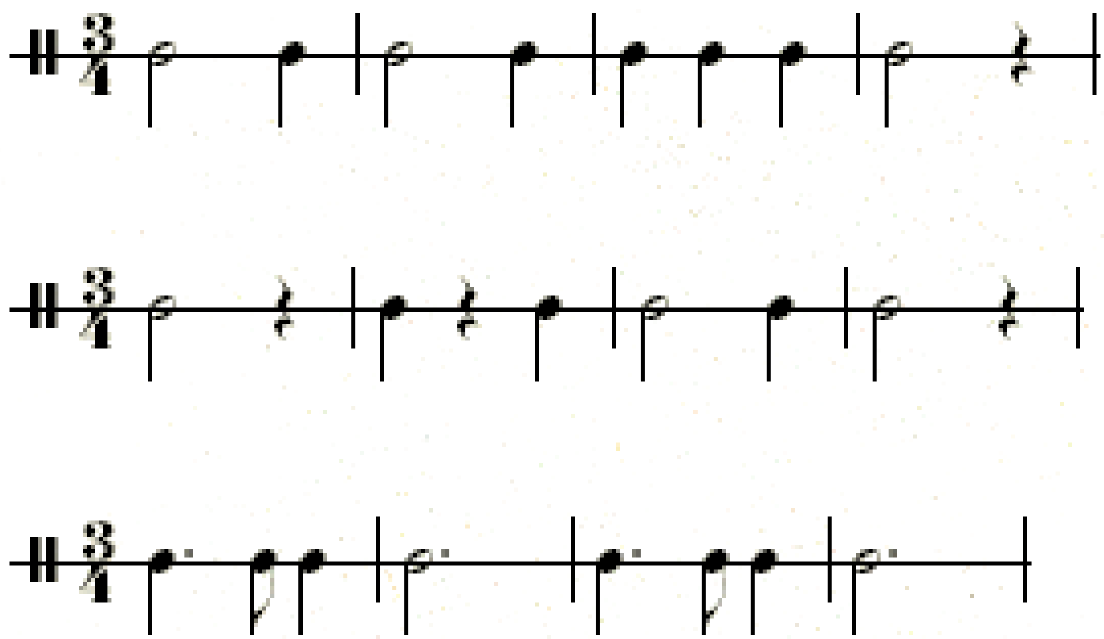

**Figure 6.3**

When you are able to perform the rhythms accurately with tapping, try to then perform them accurately by internally “hearing” the taps. When I subdivide I usually do so with internal “tapping” sounds rather than counting “1 ee and ah, 2 ee and ah.” The internal tapping works better with more complex rhythms or faster subdivisions.

When you have mastered the above examples with eighth notes, try subdivisions of sixteenth notes. Here are some further examples to practice with sixteenth note subdivisions:

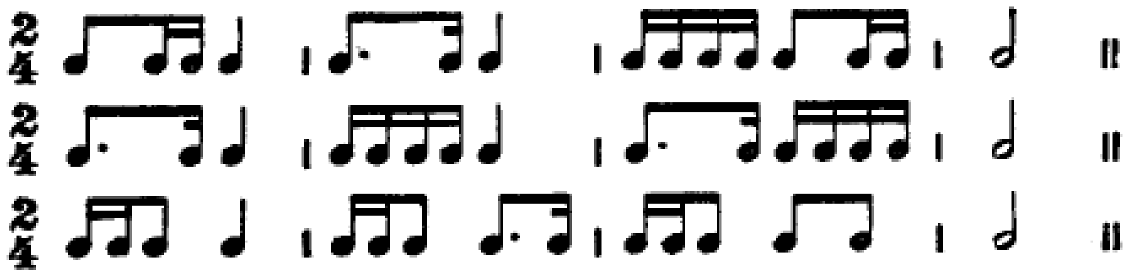

**Figure 6.4**

**Choosing Note Values for Subdivisions**

Audio engineers speak of “sampling rates,” that is the rate at which sound waves are digitally sampled. The higher the sampling rate, the more accurate is the digital representation of the sound. Similarly in the performance of music, the more subdivisions are made in each beat or each measure, the more exacting the rhythmic performance.

Consider the following figure with notes placed rhythmically placed spatially along the staff line:

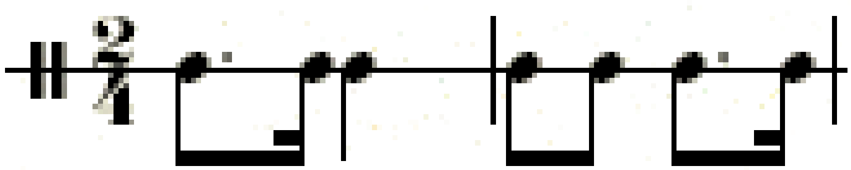

**Figure 6.5**

If we add eighth note pulses we obtain:

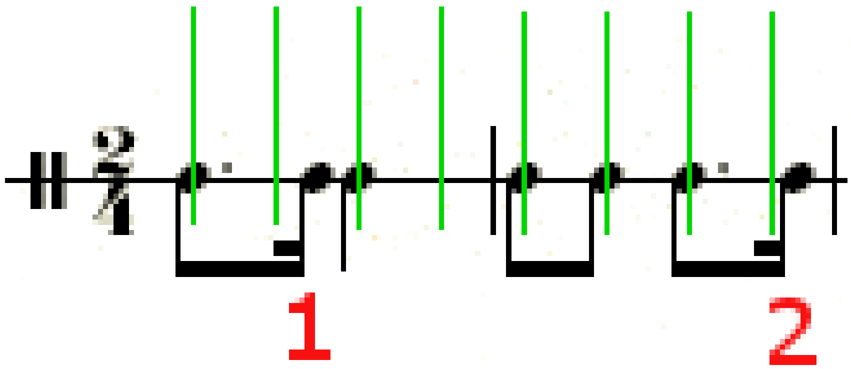


**Figure 6.6**

The sixteenth notes at numbers 1 and 2 appear rhythmically accurate; at least they are positioned so that they don't intersect the eighth note lines. However, if we subdivide the example with sixteenth notes (presented in the green and blue lines) we notice that the rhythmic placement at number 2 is not accurate:

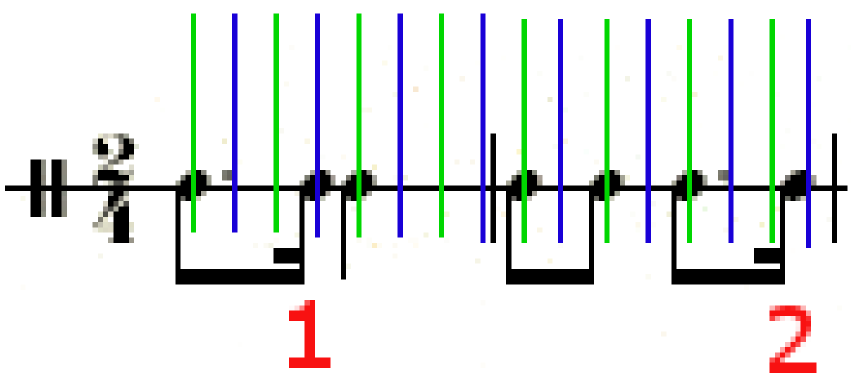


**Figure 6.7**

The sixteenth at number 1 coincides with the sixteenth note pulse (blue line) but the sixteenth at number 2 clearly is not centered with the appropriate sixteenth note pulse. The slight rhythmic sloppiness is hardly noticeable with eight note divisions but becomes quite obvious with the sixteenth note subdivisions.

Thus, the smaller and more frequent the rhythmic subdivisions, the more accurately the rhythms can be scrutinized. For this reason, musicians with the highest degree of rhythmic accuracy have the greatest mastery of very rapid subdivisions.

The rule of thumb is to pick the smallest value of subdivision you can internally hear when you perform.

# Chapter 7

# Simple and Compound Time Signatures[1]

**Simple and Compound Time Signatures**

Simple Time Signatures

| Type | Common | Uncommon |
|---|---|---|
| Simple Duple | $\frac{2}{2}$ $\frac{2}{4}$ | $\frac{2}{8}$ $\frac{2}{16}$ |
| Simple Triple | $\frac{3}{2}$ $\frac{3}{4}$ $\frac{3}{8}$ | $\frac{3}{16}$ |
| Simple Quadruple | $\frac{4}{2}$ $\frac{4}{4}$ $\frac{4}{8}$ | $\frac{4}{16}$ |

**Figure 7.1**

In simple time signatures the top number represents the number of beats per measure. The bottom number indicates the type of note equal to one beat. The division of the beat is the lower number multiplied by 2. Thus, the division of the beat is grouped by twos.

Example: 4 – There are 4 beats in each measure.
4 – A quarter note equals one beat. Division of the beat is two eighth notes.

**Figure 7.2**

[1]This content is available online at <http://cnx.org/content/m21190/1.2/>.

Compound Time Signatures

| Type | Common | | |
|---|---|---|---|
| Compound Duple | 6<br>4 | 6<br>8 | 6<br>16 |
| Compound Triple | 9<br>4 | 9<br>8 | 9<br>16 |
| Compound Quadruple | 12<br>4 | 12<br>8 | 12<br>16 |

**Figure 7.3**

In compound time signatures the top number divided by 3 represents the number of beats per measure. The bottom number indicates the type of note that divides the beat. The division of the beat is grouped by threes.

---

Example: 9 –There are 3 beats per measure.
16 – Three sixteenth notes equals 1 beat.

**Figure 7.4**

---

**Hearing simple and compound time signatures**

Listen carefully for the pulse or beat of the music. Do you hear divisions of two or three? A simple test is to try saying "apple" or "pineapple" to each beat. "Apple" has two syllables and will fit simple meters. "Pineapple"–having three syllables–naturally fits compound meters.

Protions created by Laurel A. Ewell and used with her permission.

# Chapter 8

# Meter in Music[1]

## 8.1 What is Meter?

The **meter** of a piece of music is the arrangment of its rhythms in a repetitive pattern of strong and weak beats. This does not necessarily mean that the rhythms themselves are repetitive, but they do strongly suggest a repeated pattern of pulses. It is on these pulses, the beat (Section 5.1: Beats and Measures) of the music, that you tap your foot, clap your hands, dance, etc.

Some music does not have a meter. Ancient music, such as Gregorian chants; new music, such as some experimental twentieth-century art music; and Non-Western music, such as some native American flute music, may not have a strong, repetitive pattern of beats. Other types of music, such as traditional Western African drumming, may have very complex meters that can be difficult for the beginner to identify.

But most Western[2] music has simple, repetitive patterns of beats. This makes **meter** a very useful way to organize the music. Common notation[3], for example, divides the written music into small groups of beats called measures, or bars (Section 5.1: Beats and Measures). The lines dividing each measure from the next help the musician reading the music to keep track of the rhythms (Chapter 4). A piece (or section of the piece) is assigned a time signature (Chapter 5) that tells the performer how many beats to expect in each measure, and what type of note (Chapter 1) should get one beat. (For more on reading time signatures, please see Time Signature (Chapter 5).)

Conducting[4] also depends on the meter of the piece; conductors use different conducting patterns for the different meters. These patterns emphasize the differences between the stronger and weaker beats to help the performers keep track of where they are in the music.

But the conducting patterns depend only on the pattern of strong and weak beats. In other words, they only depend on "how many beats there are in a measure", not "what type of note gets a beat". So even though the time signature is often called the "meter" of a piece, one can talk about meter without worrying about the time signature or even being able to read music. (Teachers, note that this means that children can be introduced to the concept of meter long before they are reading music. See Meter Activities[5] for some suggestions.)

## 8.2 Classifying Meters

Meters can be classified by counting the number of beats from one strong beat to the next. For example, if the meter of the music feels like "strong-weak-strong-weak", it is in **duple** meter. "strong-weak-weak-

[1]This content is available online at <http://cnx.org/content/m12405/1.12/>.
[2]"What Kind of Music is That?" <http://cnx.org/content/m11421/latest/>
[3]"The Staff" <http://cnx.org/content/m10880/latest/>
[4]"Conducting" <http://cnx.org/content/m12404/latest/>
[5]"Musical Meter Activities" <http://cnx.org/content/m13616/latest/>

strong-weak-weak" is **triple** meter, and "strong-weak-weak-weak" is **quadruple**. (Most people don't bother classifying the more unusual meters, such as those with five beats in a measure.)

Meters can also be classified as either simple or compound. In a **simple** meter, each beat is basically divided into halves. In **compound** meters, each beat is divided into thirds.

A **borrowed division** occurs whenever the basic meter of a piece is interrupted by some beats that sound like they are "borrowed" from a different meter. One of the most common examples of this is the use of triplets (p. 15) to add some compound meter to a piece that is mostly in a simple meter. (See Dots, Ties, and Borrowed Divisions (Chapter 3) to see what borrowed divisions look like in common notation.)

## 8.3 Recognizing Meters

To learn to recognize meter, remember that (in most Western[6] music) the beats and the subdivisions of beats are all equal and even. So you are basically listening for a running, even pulse underlying the rhythms of the music. For example, if it makes sense to count along with the music "ONE-and-Two-and-ONE-and-Two-and" (with all the syllables very evenly spaced) then you probably have a simple duple meter. But if it's more comfortable to count "ONE-and-a-Two-and-a-ONE-and-a-Two-and-a", it's probably compound duple meter. (Make sure numbers always come on a pulse, and "one" always on the strongest pulse.)

This may take some practice if you're not used to it, but it can be useful practice for anyone who is learning about music. To help you get started, the figure below sums up the most-used meters. To help give you an idea of what each meter should feel like, here are some animations (with sound) of duple simple[7], duple compound[8], triple simple[9], triple compound[10], quadruple simple[11], and quadruple compound[12] meters. You may also want to listen to some examples of music that is in simple duple[13], simple triple[14], simple quadruple[15], compound duple[16], and compound triple[17] meters.

[6] "What Kind of Music is That?" <http://cnx.org/content/m11421/latest/>
[7] See the file at <http://cnx.org/content/m12405/latest/duplesimple.swf>
[8] See the file at <http://cnx.org/content/m12405/latest/duplecompound.swf>
[9] See the file at <http://cnx.org/content/m12405/latest/triplesimple.swf>
[10] See the file at <http://cnx.org/content/m12405/latest/triplecompound.swf>
[11] See the file at <http://cnx.org/content/m12405/latest/quadsimple.swf>
[12] See the file at <http://cnx.org/content/m12405/latest/quadcompound.swf>
[13] See the file at <http://cnx.org/content/m12405/latest/metdup.mp3>
[14] See the file at <http://cnx.org/content/m12405/latest/mettrip.mp3>
[15] See the file at <http://cnx.org/content/m12405/latest/metquad.mp3>
[16] See the file at <http://cnx.org/content/m12405/latest/metcompdup.mp3>
[17] See the file at <http://cnx.org/content/m12405/latest/metcomptrip.mp3>

**Meters**

| Meter | Count | Example Time Signature |
| --- | --- | --- |
| Duple Simple | 1 & 2 & | 2<br>4 |
| Triple Simple | 1 & 2 & 3 & | 3<br>4 |
| Quadruple Simple | 1 & 2 & 3 & 4 & | 4<br>4 |
| Duple Compound | 1 & a 2 & a | 6<br>8 |
| Triple Compound | 1 & a 2 & a 3 & a | 9<br>8 |
| Quadruple Compound | 1 & a 2 & a 3 & a 4 & a | 12<br>8 |

**Figure 8.1:** Remember that meter is not the same as time signature; the time signatures given here are just examples. For example, 2/2 and 2/8 are also simple duple meters.

# Chapter 9

# Introduction to Subdivisions in Compound Meters[1]

**Introduction to Subdivisions in Compound Meters**

Subdivisions in compound meters (6/8, 9/8, 12/8 etc.) generally feature divisions of three eighth notes to each beat or pulse. Naturally each eighth note may then be divided with sixteenth notes:

[1]This content is available online at <http://cnx.org/content/m22811/1.1/>.

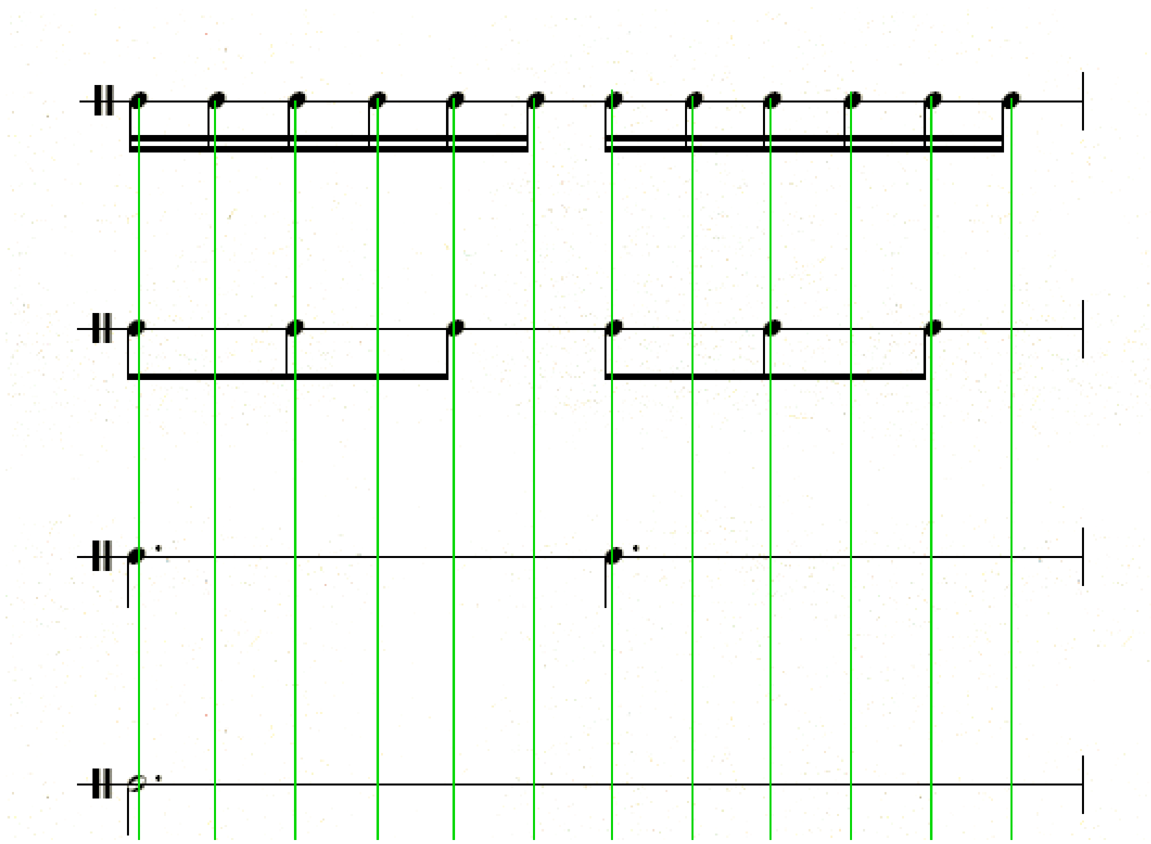

**Figure 9.1**

First perform the following by tapping eighth notes while singing the melody with "Ta" or "La" or playing it on your instrument.

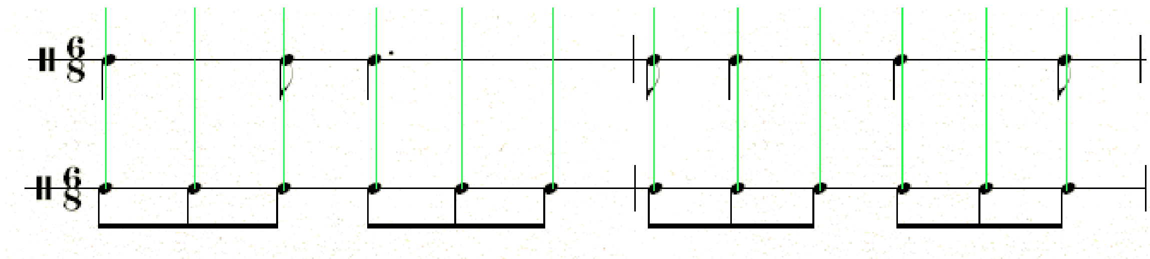

**Figure 9.2**

Once you have mastered that exercise, try to "hear" the tapping internally. Play the upper line while hearing the tapping.

Try this example in 6/8 with sixteenth note subdivisions:

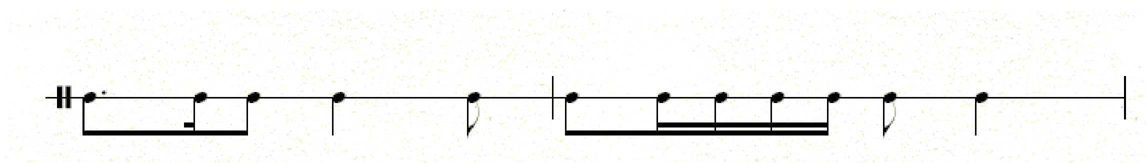

**Figure 9.3**

A good rule of thumb is to subdivide with the smallest note value possible. If the example above was performed at a slow tempo, eighth note = 60, then subdivisions with $32^{nd}$ notes would be quite possible and would help to ensure proper note values. At a tempo of dotted quarter note = 100, sixteenth note subdivisions would be preferred. This new tempo would be too rapid to subdivide easily with $32^{nd}$ notes.

Here are some further examples to subdivide with sixteenth notes (Wedge[2], p. 165):

[2]"Introduction to Rhythmic Studies" <http://cnx.org/content/m22805/latest/>

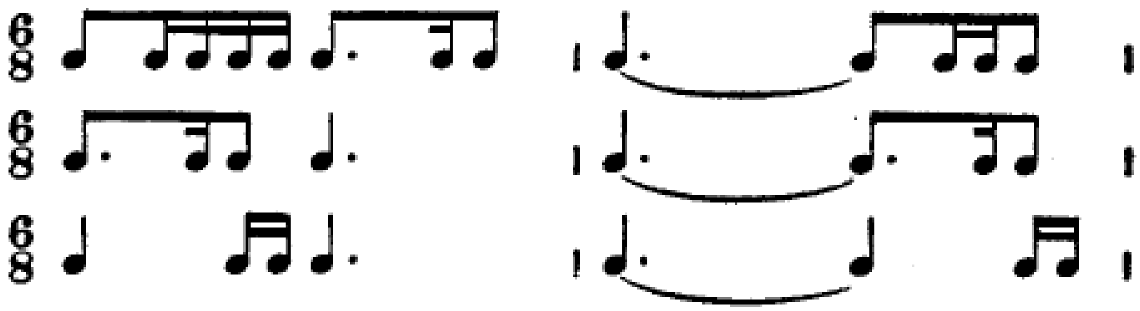

**Figure 9.4**

# Chapter 10

# Pickup Notes and Measures[1]

## 10.1 Pickup Measures

Normally, all the measures[2] of a piece of music must have exactly the number of beats (Section 5.1: Beats and Measures) indicated in the time signature (Chapter 5). The beats may be filled with any combination of notes or rests (with duration (Chapter 1) values also dictated by the time signature), but they must combine to make exactly the right number of beats. If a measure or group of measures has more or fewer beats, the time signature must change.

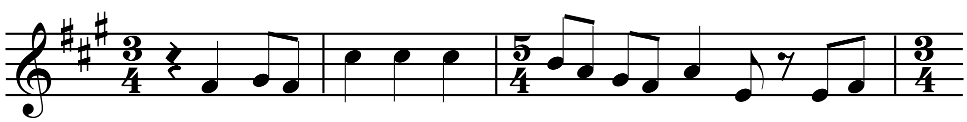

**Figure 10.1:** Normally, a composer who wants to put more or fewer beats in a measure must change the time signature, as in this example from Mussorgsky's *Boris Godunov*.

There is one common exception to this rule. (There are also some less common exceptions not discussed here.) Often, a piece of music does not begin on the strongest downbeat (p. 22). Instead, the strong beat that people like to count as "one" (the beginning of a measure), happens on the second or third note, or even later. In this case, the first measure may be a full measure that begins with some rests. But often the first measure is simply not a full measure. This shortened first measure is called a **pickup measure**.

If there is a pickup measure, the final measure of the piece should be shortened by the length of the pickup measure (although this rule is sometimes ignored in less formal written music). For example, if the meter (Chapter 8) of the piece has four beats, and the pickup measure has one beat, then the final measure should have only three beats. (Of course, any combination of notes and rests can be used, as long as the total in the first and final measures equals one full measure.

[1]This content is available online at <http://cnx.org/content/m12717/1.8/>.
[2]"The Staff": Section The Staff <http://cnx.org/content/m10880/latest/#s1>

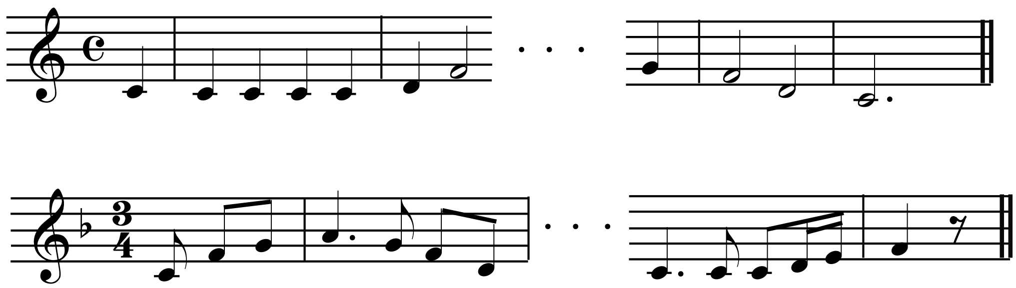

**Figure 10.2:** If a piece begins with a pickup measure, the final measure of the piece is shortened by the length of the pickup measure.

## 10.2 Pickup Notes

Any phrase[3] of music (not just the first one) may begin someplace other than on a strong downbeat. All the notes before the first strong downbeat of any phrase are the **pickup notes** to that phrase.

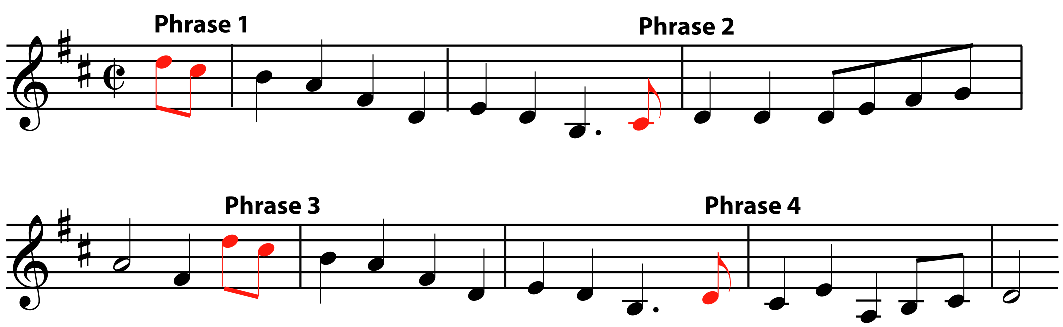


**Figure 10.3:** Any phrase may begin with pickup notes. Each of these four phrases begins with one or two pickup notes. (You may listen to the tune here[4]; can you hear that the pickup notes lead to the stronger downbeat?)

A piece that is using pickup measures or pickup notes may also sometimes place a double bar[5] (with or without repeat signs) inside a measure, in order to make it clear which phrase and which section of the music the pickup notes belong to. If this happens (which is a bit rare, because it can be confusing to read), there is still a single bar line where it should be, at the end of the measure.

[3] "Melody": Section Melodic Phrases <http://cnx.org/content/m11647/latest/#s2>
[4] See the file at <http://cnx.org/content/m12717/latest/GirlILeftBehind.MID>
[5] "The Staff" <http://cnx.org/content/m10880/latest/#p1a>

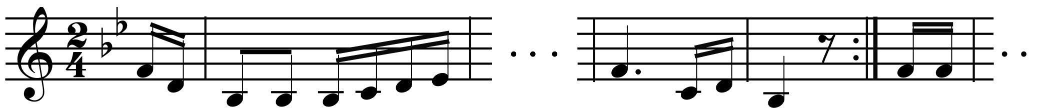

**Figure 10.4:** At the ends of sections of the music, a measure may be interrupted by a double bar that places the pickup notes in the correct section and assures that repeats have the correct number of beats. When this happens, the bar line will still appear at the end of the completed measure. This notation can be confusing, though, and in some music the pickups and repeats are written in a way that avoids these broken-up measures.

# Chapter 11

# Tempo[1]

The **tempo** of a piece of music is its speed. There are two ways to specify a tempo. Metronome markings are absolute and specific. Other tempo markings are verbal descriptions which are more relative and subjective. Both types of markings usually appear above the staff, at the beginning of the piece, and then at any spot where the tempo changes. Markings that ask the player to deviate slightly from the main tempo, such as ritardando (Gradual Tempo Changes, p. 51) may appear either above or below the staff.

## 11.1 Metronome Markings

Metronome markings are given in beats per minute. They can be estimated using a clock with a second hand, but the easiest way to find them is with a **metronome**, which is a tool that can give a beat-per-minute tempo as a clicking sound or a pulse of light. Figure 11.1 shows some examples of metronome markings.

[1] This content is available online at <http://cnx.org/content/m11648/1.11/>.

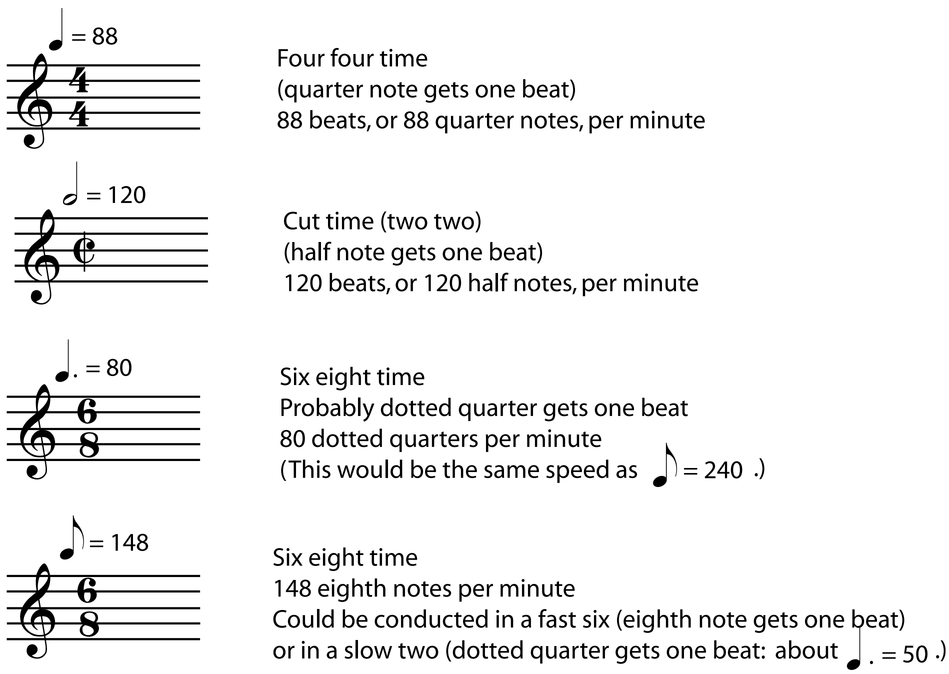


**Figure 11.1**

Metronomes often come with other tempo indications written on them, but this is misleading. For example, a metronome may have *allegro* marked at 120 beats per minute and *andante* marked at 80 beats per minute. *Allegro* should certainly be quite a bit faster than *andante*, but it may not be exactly 120 beats per minute.

## 11.2 Tempo Terms

A tempo marking that is a word or phrase gives you the composer's idea of **how fast the music should feel**. How fast a piece of music feels depends on several different things, including the texture and complexity of the music, how often the beat gets divided into faster notes, and how fast the beats themselves are (the metronome marking). Also, the same tempo marking can mean quite different things to different composers; if a metronome marking is not available, the performer should use a knowledge of the music's style and genre, and musical common sense, to decide on the proper tempo. When possible, listening to a professional play the piece can help with tempo decisions, but it is also reasonable for different performers to prefer slightly different tempos for the same piece.

Traditionally, tempo instructions are given in Italian.

**Some Common Tempo Markings**

- **Grave** - very slow and solemn (pronounced "GRAH-vay")
- **Largo** - slow and broad ("LAR-go")
- **Larghetto** - not quite as slow as largo ("lar-GET-oh")
- **Adagio** - slow ("uh-DAH-jee-oh")

- **Lento** - slow ("LEN-toe")
- **Andante** - literally "walking", a medium slow tempo ("on-DON-tay")
- **Moderato** - moderate, or medium ("MOD-er-AH-toe")
- **Allegretto** - Not as fast as allegro ("AL-luh-GRET-oh")
- **Allegro** - fast ("uh-LAY-grow")
- **Vivo, or Vivace** - lively and brisk ("VEE-voh")
- **Presto** - very fast ("PRESS-toe")
- **Prestissimo** - very, very fast ("press-TEE-see-moe")

These terms, along with a little more Italian, will help you decipher most tempo instructions.

**More useful Italian**

- **(un) poco** - a little ("oon POH-koe")
- **molto** - a lot ("MOLE-toe")
- **piu** - more ("pew")
- **meno** - less ("MAY-no")
- **mosso** - literally "moved"; motion or movement ("MOE-so")

**Exercise 11.1** ***(Solution on p. 52.)***

Check to see how comfortable you are with Italian tempo markings by translating the following.

1. un poco allegro
2. molto meno mosso
3. piu vivo
4. molto adagio
5. poco piu mosso

Of course, tempo instructions don't have to be given in Italian. Much folk, popular, and modern music, gives instructions in English or in the composer's language. Tempo indications such as "Not too fast", "With energy", "Calmly", or "March tempo" give a good idea of how fast the music should feel.

## 11.3 Gradual Tempo Changes

If the tempo of a piece of music suddenly changes into a completely different tempo, there will be a new tempo given, usually marked in the same way (metronome tempo, Italian term, etc.) as the original tempo. Gradual changes in the basic tempo are also common in music, though, and these have their own set of terms. These terms often appear below the staff, although writing them above the staff is also allowed. These terms can also appear with modifiers (More useful Italian, p. 51) like *molto* or *un poco*. You may notice that there are quite a few terms for slowing down. Again, the use of these terms will vary from one composer to the next; unless beginning and ending tempo markings are included, the performer must simply use good musical judgement to decide how much to slow down in a particular *ritardando* or *rallentando*.

**Gradual Tempo Changes**

- **accelerando** - (abbreviated *accel.*) accelerating; getting faster
- **ritardando** - (abbrev. *rit.*) slowing down
- **ritenuto** - (abbrev. *riten.*) slower
- **rallentando** - (abbrev. *rall.*) gradually slower
- **rubato** - don't be too strict with the rhythm; while keeping the basic tempo, allow the music to gently speed up and relax in ways that emphasize the phrasing
- **poco a poco** - little by little; gradually
- **Tempo I** - ("tempo one" or "tempo primo") back to the original tempo (this instruction usually appears above the staff)

# Solutions to Exercises in Chapter 11

**Solution to Exercise 11.1 (p. 51)**

1. a little fast
2. much less motion = much slower
3. more lively = faster
4. very slow
5. a little more motion = a little faster

## Index of Keywords and Terms

**Keywords** are listed by the section with that keyword (page numbers are in parentheses). Keywords do not necessarily appear in the text of the page. They are merely associated with that section. *Ex.* apples, § 1.1 (1) **Terms** are referenced by the page they appear on. *Ex.* apples, 1


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