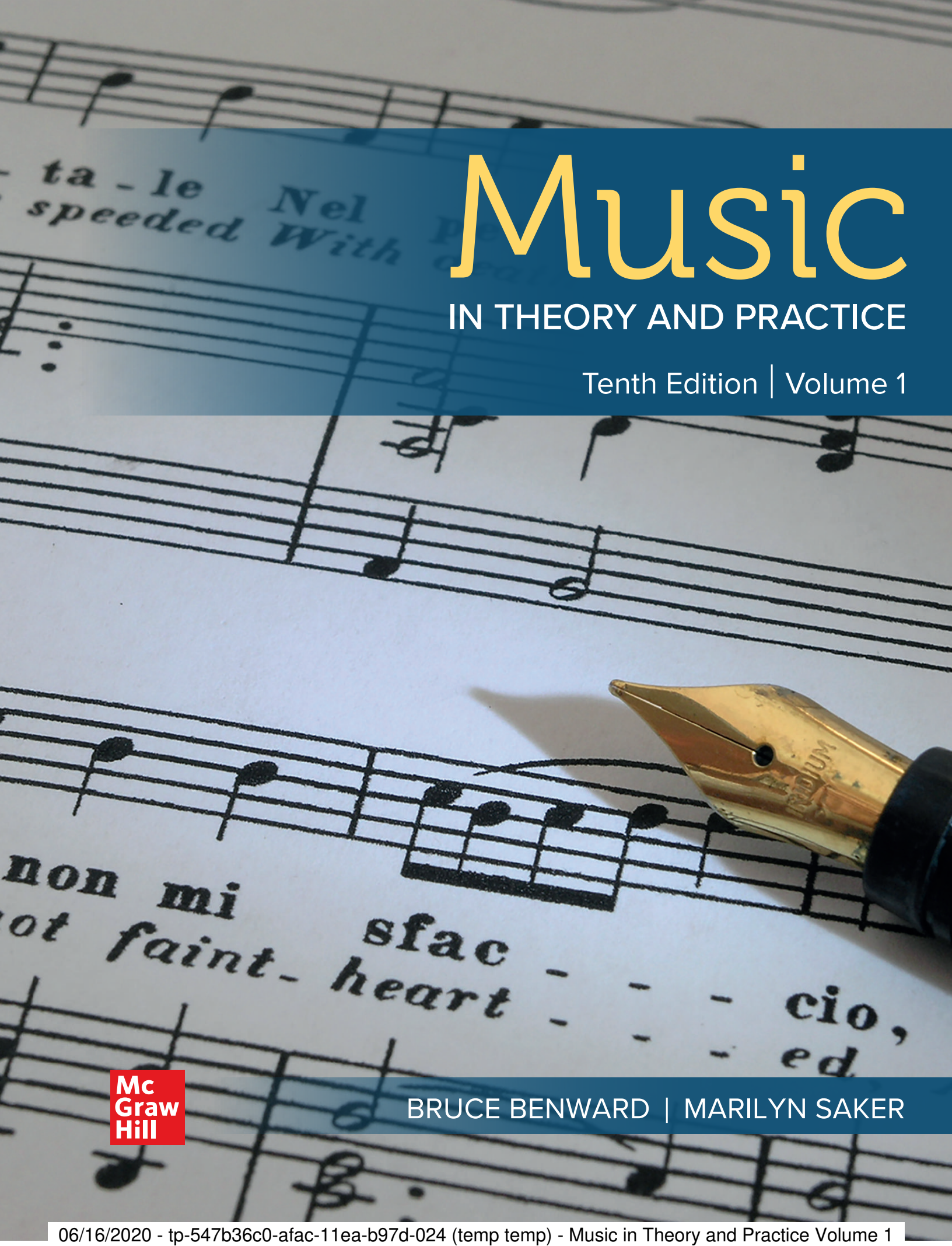


# Music

## IN THEORY AND PRACTICE

# Music

## IN THEORY AND PRACTICE

VOLUME I

Tenth Edition

**Bruce Benward**
Late of the University of Wisconsin–Madison

**Marilyn Saker**
Eastern Michigan University

Mc Graw Hill

MUSIC IN THEORY AND PRACTICE: VOLUME 1, TENTH EDITION

Published by McGraw-Hill Education, 2 Penn Plaza, New York, NY 10121. 

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 LMN 25 24 23 22 21 20

ISBN 978-1-260-05582-5 (bound edition)
MHID 1-260-05582-5 (bound edition)
ISBN 978-1-260-49345-0 (loose-leaf edition)
MHID 1-260-49345-8 (loose-leaf edition)

Portfolio Manager: *Sarah Remington*
Product Developers: *Mary Ellen Curley, Elizabeth Murphy*
Marketing Manager: *Meredith Leo DiGiano*
Content Project Managers: *Rick Hecker, Katie Reuter*
Buyer: *Susan K. Culbertson*
Design: *David W. Hash*
Content Licensing Specialist: *Brianna Kirschbaum*
Cover Image: ©*Robert Kyllo/Shutterstock*
Compositor: *Aptara, Inc*.



Library of Congress Control Number: 2019955991



mheducation.com/highered

# Contents

# Preface

## To the Student

Before you begin your study of music theory, we would like to discuss the subject in general and explain what you may expect to gain from its study. You have probably had little previous experience in music theory, and you may be wondering why you should occupy your time with it.

If you are typical of most young musicians beginning a serious study of your art, you already play an instrument or sing well, but you are interested in acquiring further technical skills and interpretive insights. You probably have been a performer for some years and have had success in public concerts either as a soloist or as part of a group (band, orchestra, or chorus). From these experiences you have developed a keen musical intuition and want to strengthen it further. Your musical intuition includes a vast storehouse of familiar sounds, established patterns of melody, harmony, and rhythm, and an artistic consciousness that you draw upon thousands of times in the performance of a single composition, without conscious remembering or reasoning. You make split-second decisions about the phrasing of a melody, the application of dynamics (indications of loud and soft), and the tempo of the music you play. Your musical intuition has become a part of you through your experience and, indeed, is one of the most valuable gifts in your possession.

The study of music theory interacts with intuition—honing, sharpening, and enhancing it with further insights and perceptions. Much of what you learn from this book will at first seem to be simply surface information, but that information will eventually amplify and broaden your musical intuition.

This book is essentially a study of patterns in music. It looks at music literature as highly organized tonal designs. With few exceptions, the terms we employ are in common use, and many of the procedures we use in analysis and composition are standard practice. The conclusions we reach, however, may differ at times from your judgments or from those of your professor. As long as your analysis is backed by logical reasoning and is a true assessment of the sounds you hear, such differences of opinion are healthy and are positive indications that you are developing your own convictions—certainly one of the objectives of the course.

Included in the book are a large number of musical examples. Each one illustrates a point we make in the text, so it is critical that you study the musical examples and, if possible, play them on the piano. Descriptions and definitions are often explained better through music illustrations than by long, involved written explanations, so our narrative material is rather short and to the point. It is vital that you experience musically the materials in this course. It does not suffice simply to know terms—you must go one step further and make these terms and ideas a familiar and practical part of your entire approach to music.

There are three types of assignments, and each has its specific purpose:

1. *Concentrated drill on a particular musical pattern or patterns.* Many patterns do not occur in sufficient quantity in a single composition to give you enough practice in identifying them, so these drills contain patterns extracted from their musical setting to let you work on a large variety in a shorter space of time.
2. *A search for patterns and relationships in a music composition.* This exploration inspects multiple aspects of a work and seeks those components that create musical style. You will gain skill in analysis, of critical importance to all musicians.
3. *Composition.* Learning to manipulate musical devices successfully in a composition is the most important goal of this text.

## Summary

1. Your musical intuition is a valuable asset. Use it often.
2. A study of music theory makes you think consciously about the patterns in music.
3. The study of music theory will enhance and reinforce your musical intuition.
4. Although terms and procedures are objective, conclusions in the analysis of music are often subjective, and thus differing viewpoints should be expected and accepted.
5. The music illustrations are even more important than textual material. Study the illustrations at least as diligently as the written material.
6. Application of terms and concepts to actual musical situations is of the utmost importance. The memorizing of definitions is in itself of little significance.
7. In the world of music the highest premiums go to those with the most perceptive, imaginative, and creative minds. Creativity combined with a thorough knowledge of music is the best guarantee for a successful career in music.

## To the Instructor

In the words of the composer George Crumb, "Music might be defined as a system of proportions in the service of a spiritual impulse." In the same vein, music theory might be defined as the study of the artful designs, ingenious proportions, and inventive patterns in music that are transformed by the mind into aesthetic experience. The purpose of this two-volume text is to present the basic ingredients of the art of music so that structure, design, and language are made clear and accessible to the student examining the array of tonal configurations found in music literature. The text provides a basis for the integration of the following skills and knowledge, which are important in any undergraduate theory program:

| | |
|---|---|
| **Analysis Skills** | The ability to discern the design, proportions, and patterns of music. |
| **Historical Perspective** | An understanding of the rich heritage of the past and the styles of music that evolved during the different periods of musical writing. |
| **Compositional Skills** | Insight into the ways in which music is put together and into the forms, elements, and resolutions required of the composer. |
| **A "Seeing" Ear** | The ability to hear music and determine the nature of the musical devices, the melody, the harmony, the rhythm, and the form. Although this book does not address itself specifically to the topic, the professor may utilize materials from it for this purpose. Additional material may be found in *Ear Training: A Technique for Listening* by Bruce Benward and J. Timothy Kolosick. |
| **A "Hearing" Eye** | The ability to look at music and determine from sight alone how it will sound. Additional material to develop this skill may be found in *Sight Singing Complete* by Maureen Carr and Bruce Benward. |
| **Performance** | This book does not address itself specifically to performance; however, it provides ample opportunity for the developing musician to improve performance skills while gaining analytical, historical, and compositional perspectives. |

## Features

Although this text is written from a traditional point of view, the following features distinguish it from some other books in music theory:

1. No previous knowledge of music theory is required; however, the ability to read music and play an instrument or sing is assumed.
2. The fundamentals of music are thoroughly presented.
3. Two-part and four-part voice leading and harmonization are considered important priorities.
4. A thorough study of melody, rhythm, and texture is included. In this way, the authors hope to present a more balanced view of the structure of music than those books that concentrate only on harmony and voice leading.

5. The text offers a historical perspective. Each chapter includes a short section labeled "History," which relates the topic at hand to the history of music. A brief overview of music history and its relation to European and American history is included in Appendix F.
6. Music from the Renaissance to the contemporary period is examined in both volumes.
7. The text integrates a study of jazz and popular music, which is indigenous to American culture, into the traditional study of European art music.
8. Specific compositions are studied. The text continually directs attention to the musical examples and encourages class discussion of them.
9. The in-class composition and performance of music is encouraged. Many of the assignments are designed to promote student interest in developing composition skills.
10. The two volumes provide a complete basis for the study of music theory. Volume 1 is usually completed in the first year of instruction and volume 2 in later courses.
11. The chapters may be studied in the order preferred by the instructor. Some recommendations for reorganization are listed in the instructor's manuals that accompany the two volumes.
12. An outline format is maintained throughout the two volumes. This format ensures conciseness, efficiency, and ease in locating specific topics.

## New to This Edition

The tenth edition of *Music in Theory and Practice* includes the following enhancements:

1. Both core texts and workbooks are now available in the McGraw-Hill eBook. The eBooks are included in Connect or can be purchased via the ReadAnywhere app. When accessed in the app, students can read off-line and data-free by downloading the entire text or only the chapters they need. They can also highlight and take notes in the eBook, and their highlights will sync between the app and Connect.
2. A significant number of new audio files (MP3s) are available for music appearing in the books. These audio files are embedded in the eBooks but are also available to purchasers of print copies through the Connect Online Learning Center.
3. Chapters are now numbered continuously across volumes 1 and 2 of *Music in Theory and Practice* and its workbooks, in both print and eBook formats.
4. New examples have been added throughout the chapters to augment and demonstrate explanations.
5. Several new assignments provide additional practice for students and allow instructors greater flexibility in course planning.

## Texts and Supplements

This two-volume series is a part of a carefully integrated package. The following texts and ancillaries are available for the tenth edition:

For students and instructors:
*Music in Theory and Practice,* Volume 1
*Music in Theory and Practice,* Volume 2
Workbook to Accompany *Music in Theory and Practice,* Volume 1
Workbook to Accompany *Music in Theory and Practice,* Volume 2
eBook
SmartBook® 2.0, an adaptive study resource available within Connect
Connect Access card + Volume I Workbook + Volume II Workbook
Connect Access card + Volume I Workbook:
Connect Access card + Volume II Workbook

For instructors:
Instructor's Manual to Accompany *Music in Theory and Practice,* Volume 1
Instructor's Manual to Accompany *Music in Theory and Practice,* Volume 2
Workbook Solutions Manual to Accompany *Music in Theory and Practice,* Volume 1
Workbook Solutions Manual to Accompany *Music in Theory and Practice,* Volume 2

Resources available from the Connect Online Learning Center include printable versions of the Instructor's Manuals and Workbook Solutions Manuals, audio files, assignment

templates compatible with Finale® Music Notation software, supplementary drill assignments, testing materials, and recordings. Audio files available for this edition of *Music in Theory and Practice* are identified throughout the texts and workbooks with the ♫ graphic.

## Acknowledgments

I am indebted to my multitalented colleague, Samuel Joshua, for producing the large number of audio files new to the tenth edition. The thoughtful care with which he approached this enormous task, and his expansive knowledge of music production, significantly benefitted *Music in Theory and Practice*. Thank you, Sam.

It is with sincere gratitude that I thank jazz musician Mark Pappas for his intelligent advice regarding the jazz and popular-music elements appearing throughout the text. His guidance has proven time and again to be invaluable.

Grateful acknowledgment is extended to the highly professional staff at McGraw-Hill. It was a sincere honor to work with Elizabeth Murphy, Sarah Remington, Rick Hecker, Brianna Kirschbaum, Barbara Hacha, and Betty Chen. The helpful suggestions made by reviewers for the tenth edition are also acknowledged:

Reginald Klopfenstein, *Bethel University*
Brian Kubin, *Truman State University*
Timothy Nutting, *Navarro College*
Leslie Odom, *University of Florida*
J. Whitney Prince, *Eastern Michigan University*
Anne Watson, *Northeastern State University*

Most importantly of all, I am genuinely grateful for the extraordinary set of circumstances that led me to study with the incomparable Bruce Benward. It's funny how the truly talented teachers never really leave you. Thank you, Bruce.

*Marilyn Saker*

# The Materials of Music: Sound and Time

**Topics**

| | | |
|---|---|---|
| Sound | Tone | Beat |
| Vibration | Intensity | Rhythm |
| Compression | Acoustics | Timbre |
| Rarefaction | Decibels | Harmonic Series |
| Frequency | Duration | Partials |
| Pitch | Meter | Fundamental |

The basic materials of music are sound and time. When you play an instrument or sing, you are producing sounds, so it is important that you thoroughly understand these basic materials. Sounds are used to structure time in music. Time occurs in the duration of the sounds and the silences between sounds. This book is devoted to a study of the complex relationship between these two basic materials.

## Sound

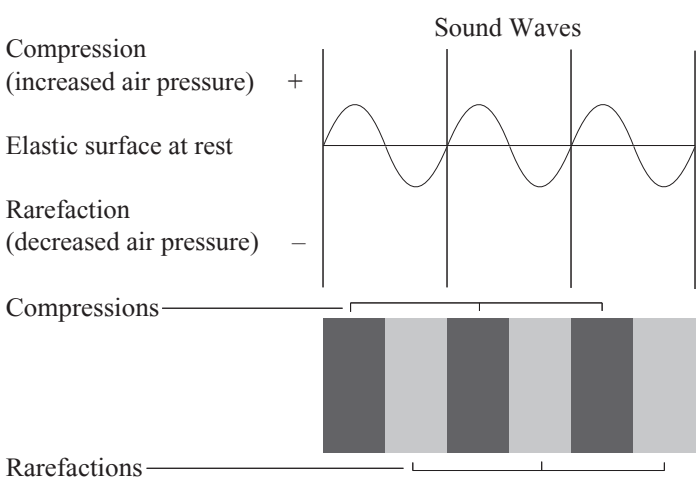
*Sound* is the sensation perceived by the organs of hearing when vibrations (sound waves) reach the ear.

## Vibration

*Vibration* is the periodic motion of a substance. When you play an instrument, parts of the instrument (the strings, sounding board, etc.) and the air inside and around the instrument vibrate.

## Compression and Rarefaction

These terms refer to the alternation of increased (*compression*) and decreased (*rarefaction*) pressure in the air caused by an activated (vibrating) surface or air column. One complete cycle of compression and rarefaction produces a vibration, or sound wave.



### Frequency

*Frequency* refers to the number of compression–rarefaction cycles that occur per unit of time, usually one second. Audible sounds for the human ear range from 20 to 20,000 cycles per second.

## The Four Properties of Sound

Sound has four identifiable characteristics or properties: *pitch, intensity, duration,* and *timbre.* Despite how complicated a composition may be, these four are the only variables with which composers and performers have to work.

### Pitch

*Pitch* is the highness or lowness of a sound. Variations in frequency are what we hear as variations in pitch: The greater the number of sound waves produced per second of an elastic body, the higher the sound we hear; the fewer sound waves per second, the lower the sound.

#### *Tone*

A *tone* is a musical sound of definite pitch.

### Intensity

*Intensity* (amplitude) is heard as the loudness or softness of a pitch. In *acoustics* (the science of sound), intensity is the amount of energy affecting the vibrating body; the physicist measures intensity on a scale from 0 to 130 in units called *decibels.* In musical notation, gradations of intensity are indicated with the following Italian words and their abbreviations:

| Italian Word | Symbol | Translation | Average Decibels |
|---|---|---|---|
| Pianissimo | *pp* | Very soft | 40 |
| Piano | *p* | Soft | 50 |
| Mezzo piano | *mp* | Moderately soft | 60 |
| Mezzo forte | *mf* | Moderately loud | 70 |
| Forte | *f* | Loud | 80 |
| Fortissimo | *ff* | Very loud | 100 |

### Duration

*Duration* is the length of time a pitch, or tone, is sounded. For patterns of duration, the following terms are used: *meter* and *rhythm.*

#### *Meter*

*Meter* describes regularly recurring pulses of equal duration, generally grouped into patterns of two, three, four, or more with one of the pulses in each group accented. These patterns of strong (>) and weak (⌣) pulses are called *beats.* For example:

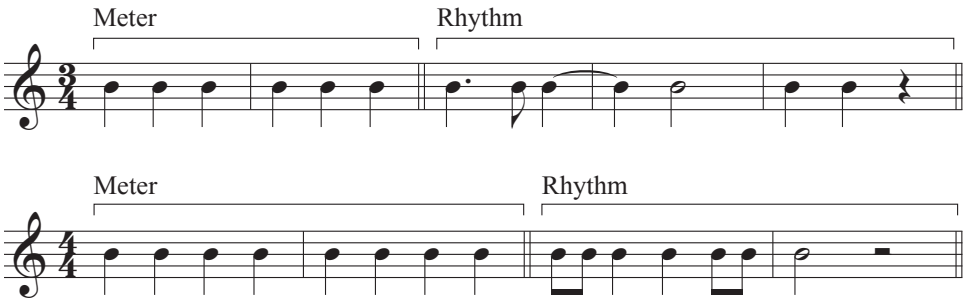
Duple meter: > ⌣ | > ⌣ | > ⌣ | =

Triple meter: > ⌣ ⌣ | > ⌣ ⌣ | > ⌣ ⌣ | =

Duple (two-beat) meter and triple (three-beat) meter are the two basic meters. All other meters result from some combination of these two.

#### *Rhythm*

Operating in conjunction with the meter, *rhythm* is a pattern of uneven durations. While the steady beats of the meter combine to form measures, a rhythm may be a pattern of almost any length.



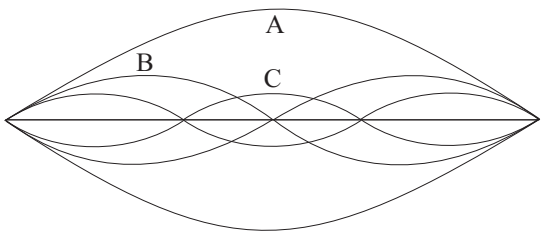

## Timbre

*Timbre* is the tone quality or color of a sound. It is the property of sound that permits us, for instance, to distinguish the difference between the sound of a clarinet and an oboe.

This sound quality is determined by the shape of the vibrating body, its material (metal, wood, human tissue), and the method used to put it in motion (striking, bowing, blowing, plucking). It is also the result of the human ear's perception of a series of tones called the harmonic series, which is produced by all instruments.

### *Harmonic Series*

A *harmonic series* includes the various pitches produced simultaneously by a vibrating body. This physical phenomenon results because the body vibrates in sections as well as in a single unit. A string, for example, vibrates along its entire length as well as in halves, thirds, quarters, and so on.

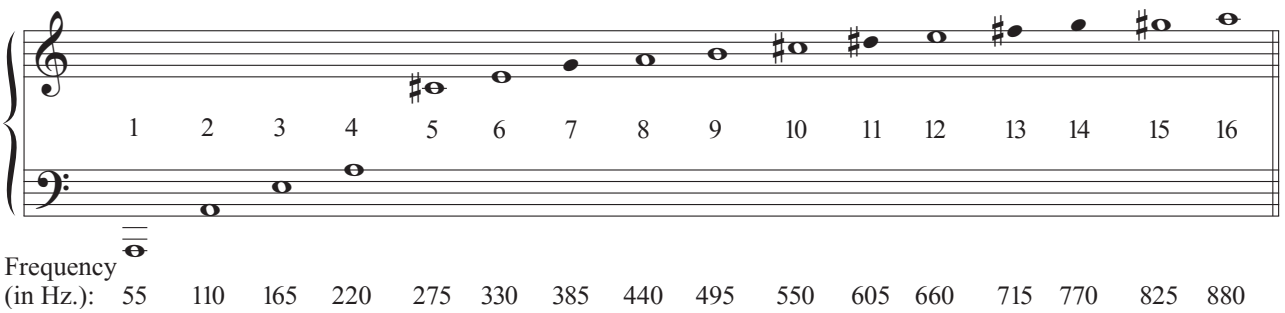



A – String vibrating as a unit
B – String vibrating in halves
C – String vibrating in thirds

### *Partials*

The pitches produced simultaneously by the vibrating sections are called *partials* or *harmonics.* The first partial, often called the *fundamental,* and the series of partials constitute a musical tone. Because the fundamental is the lowest frequency and is also perceived as the loudest, the ear identifies it as the specific pitch of the musical tone.

Although the harmonic series theoretically goes to infinity, there are practical limits; the human ear is insensitive to frequencies above 20,000 Hz. (Hz is the abbreviation for hertz, a standard measurement of frequency expressed in cycles per second.) The following illustration carries the harmonic series of an A fundamental to the sixteenth partial:



The individual partials that make up a musical tone are not distinguished separately but are heard by the human ear as a blend that characterizes timbre.

You may notice that the harmonic series looks very similar to the "open" tones on brass instruments. The brass instruments and some other instruments, such as the woodwinds, are capable of playing various pitches in the harmonic series.

## Summary

Music is an art of sound and time, and the basic characteristics of musical tone—pitch, duration, intensity, and timbre—are the fundamental elements. The principal concern in this book is to determine how musical tones interact with each other to produce music.

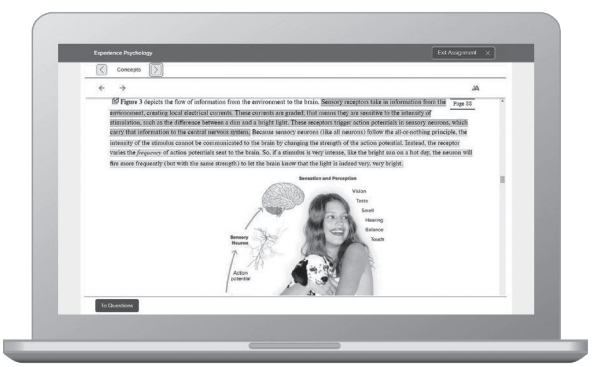
# FOR INSTRUCTORS

## You're in the driver's seat.

Want to build your own course? No problem. Prefer to use our turnkey, prebuilt course? Easy. Want to make changes throughout the semester? Sure. And you'll save time with Connect's auto-grading too.

**65%**

Less Time Grading



Laptop: McGraw-Hill; Woman/dog: George Doyle/Getty Images

## They'll thank you for it.

Adaptive study resources like SmartBook® 2.0 help your students be better prepared in less time. You can transform your class time from dull definitions to dynamic debates. Find out more about the powerful personalized learning experience available in SmartBook 2.0 at **www.mheducation.com/highered/connect/smartbook**

## Make it simple, make it affordable.

Connect makes it easy with seamless integration using any of the major Learning Management Systems—Blackboard®, Canvas, and D2L, among others—to let you organize your course in one convenient location. Give your students access to digital materials at a discount with our inclusive access program. Ask your McGraw-Hill representative for more information.

Padlock: Jobalou/Getty Images

## Solutions for your challenges.

A product isn't a solution. Real solutions are affordable, reliable, and come with training and ongoing support when you need it and how you want it. Our Customer Experience Group can also help you troubleshoot tech problems—although Connect's 99% uptime means you might not need to call them. See for yourself at **status.mheducation.com**

Checkmark: Jobalou/Getty Images

SUPPORT AT every step

# FOR STUDENTS

## Effective, efficient studying.

Connect helps you be more productive with your study time and get better grades using tools like SmartBook 2.0, which highlights key concepts and creates a personalized study plan. Connect sets you up for success, so you walk into class with confidence and walk out with better grades.

## Study anytime, anywhere.

Download the free ReadAnywhere app and access your online eBook or SmartBook 2.0 assignments when it's convenient, even if you're offline. And since the app automatically syncs with your eBook and SmartBook 2.0 assignments in Connect, all of your work is available every time you open it. Find out more at **www.mheducation.com/readanywhere**

***"I really liked this app—it made it easy to study when you don't have your textbook in front of you."***

- Jordan Cunningham, Eastern Washington University


Calendar: owattaphotos/Getty Images

## No surprises.

The Connect Calendar and Reports tools keep you on track with the work you need to get done and your assignment scores. Life gets busy; Connect tools help you keep learning through it all.

## Learning for everyone.

McGraw-Hill works directly with Accessibility Services Departments and faculty to meet the learning needs of all students. Please contact your Accessibility Services office and ask them to email accessibility@mheducation.com, or visit **www.mheducation.com/about/accessibility** for more information.

Top: Jenner Images/Getty Images, Left: Hero Images/Getty Images, Right: Hero Images/Getty Images

PART A

# The Fundamentals of Music

Before you begin your study of the structure of music, you must first understand the notation and basic elements of music: the fundamentals of music. As an experienced musician, you have probably learned many of these concepts in your previous studies. Our purpose here is to present these basic musical facts in a systematic way to aid you in gaining fluency and filling any gaps in your knowledge. Even if you know the materials presented here, we urge you to take this opportunity to practice until you can recall the fundamentals without a moment of hesitation. Your success in understanding the structure of music will depend on this ability.

Our goal in this and the following book is to show you how music is put together. We will deal with a wide variety of music from very early to the most recent, from art music to folk and popular music. As a prelude to this adventure, you must understand in broad terms the history of Western music and see the relationships among the various styles. For this reason we have included a brief overview of music history in Appendix F. We wish you success in your work and hope that you find here the beginning of a lifetime of exciting and serious study of the art of music.

CHAPTER 1

# Notation

## Topics

Pitch
Staff
Letter Names
Clefs
Treble Clef
Bass Clef
Grand Staff
Middle C
Ledger Lines
C Clef
Alto Clef
Tenor Clef
Soprano Clef
Mezzo Soprano Clef
Baritone Clef
Octave Identification
Accidentals
Sharp
Flat
Natural
Double Sharp
Double Flat
Interval
Enharmonic Equivalents
Half-Step Motion
Duration
Breve and Rest
Whole Note and Rest
Half Note and Rest
Quarter Note and Rest
Eighth Note and Rest
Sixteenth Note and Rest
Thirty-Second Note and Rest
Sixty-Fourth Note and Rest
Tie
Dot
Second Dot
Irregular Divisions and Subdivisions
Rhythm
Pulse or Beat
Meter
Meter Signatures
Simple Meter
Compound Meter
Duple, Triple, and Quadruple Meters
Asymmetrical Meter
Syncopation
Hemiola
Dynamic Markings
Tempo

## Important Concepts

Music notation is much more precise and complicated than written language. When we notate music, we use symbols that show three of the four properties of sound described in the introduction: pitch and duration are given accurately, and relative intensity is indicated. Furthermore, pitch and duration are shown simultaneously.

## Notation of Pitch

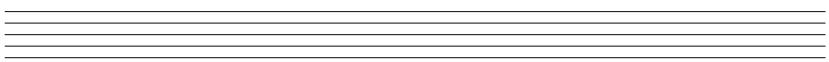
The term *pitch* describes the highness or lowness (the frequency) of a tone. In music notation, pitches are represented by symbols positioned on a staff and identified with letter names.

## The Staff

The *staff* consists of five equally spaced horizontal lines.

Figure 1.1

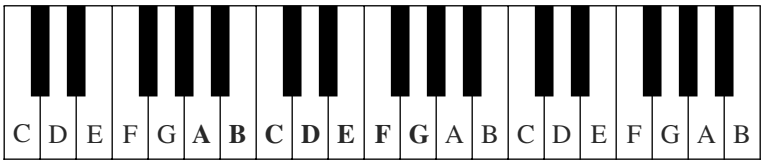
Five lines



## Letter Names

The various pitches are referred to by the first seven *letters* of the alphabet (A B C D E F G), as shown on the piano keyboard in Figure 1.2.

Figure 1.2




## The Clefs

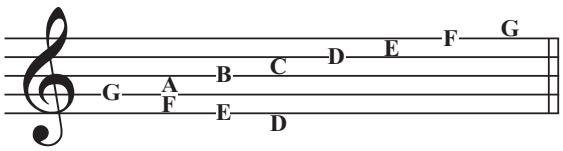
A *clef* is a symbol placed at the beginning of a line of music that establishes the letter names of the lines and spaces of the staff.

### *Treble Clef (G)*

The *treble clef* or *G clef* is an ornate letter G. The curved line terminates at the second line of the staff, thus designating the letter name of a note on that line as G.

Figure 1.3

Staff with treble or G clef

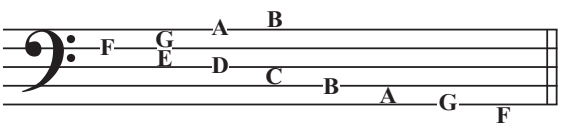



### *Bass Clef (F)*

The *bass clef* is called the *F clef* because it was derived from the letter F. The dots are placed above and below the fourth line of the staff, designating that line as F.

Figure 1.4

Staff with bass or F clef

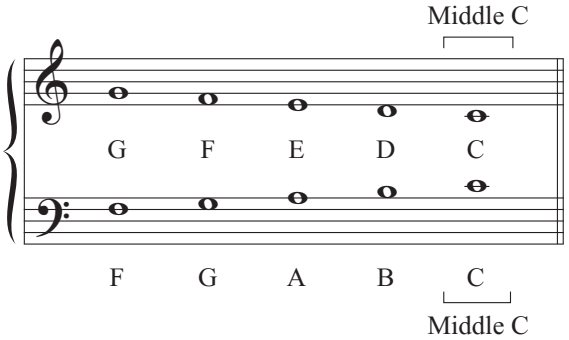



### *Grand Staff*

Together, the treble and bass staves make up a *grand staff.* Figure 1.5 shows the point at which both clefs converge. The two Cs are the same pitch: *middle C*.

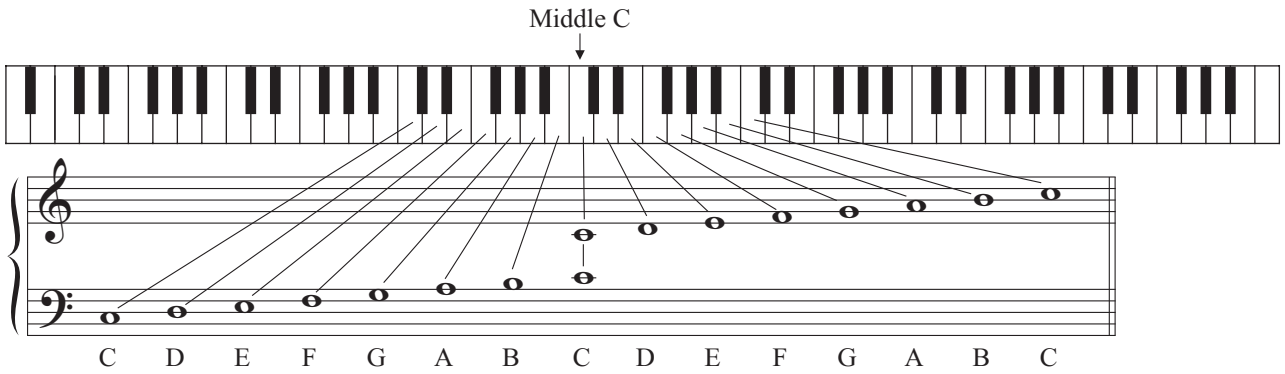
Figure 1.5

Grand staff



The grand staff is associated most often with keyboard music. Figure 1.6 shows the relationship between the grand staff, the standard 88-key piano keyboard, and middle C.

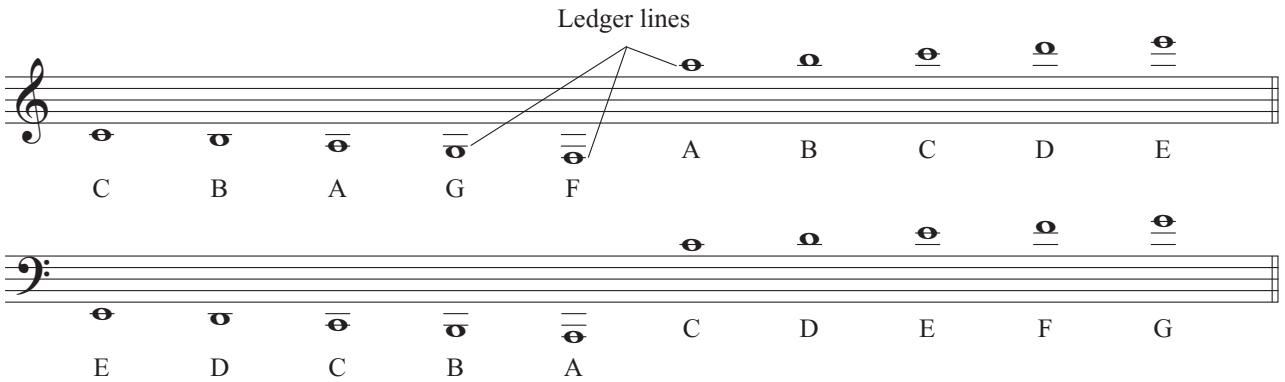
Figure 1.6




### Ledger Lines

Pitches that go beyond the limits of the staff are written by adding *ledger lines* above or below the staff. Ledger lines, which parallel the staff, accommodate only one note (see Figure 1.7).

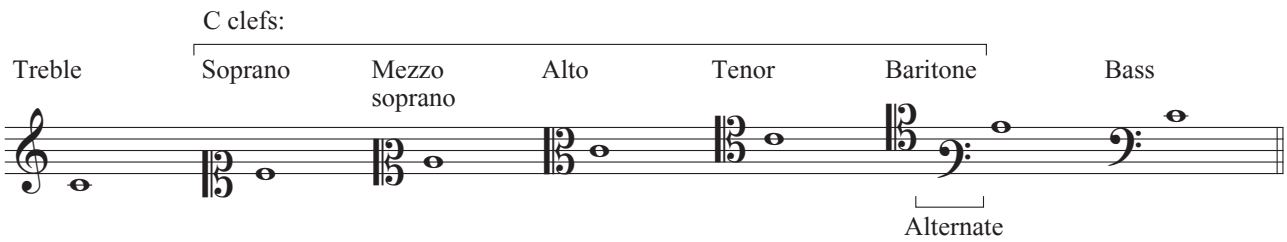
Figure 1.7




### C Clef

A *C clef* may be positioned on any line of the staff to designate middle C. This clef is coupled with a set of secondary names that identify each of the possible positions—soprano, mezzo soprano, alto, tenor, and baritone (see Figure 1.8).

Figure 1.8



### Alto Clef

The *alto clef* is a C clef that designates the third line of the staff as middle C (see Figure 1.8). It is the standard clef used in music for viola.

### Tenor Clef

The *tenor clef* is a C clef that designates the fourth line of the staff as middle C (see Figure 1.8). The tenor clef is occasionally found in music written for cello, bassoon, or trombone.

### Soprano, Mezzo Soprano, and Baritone Clefs

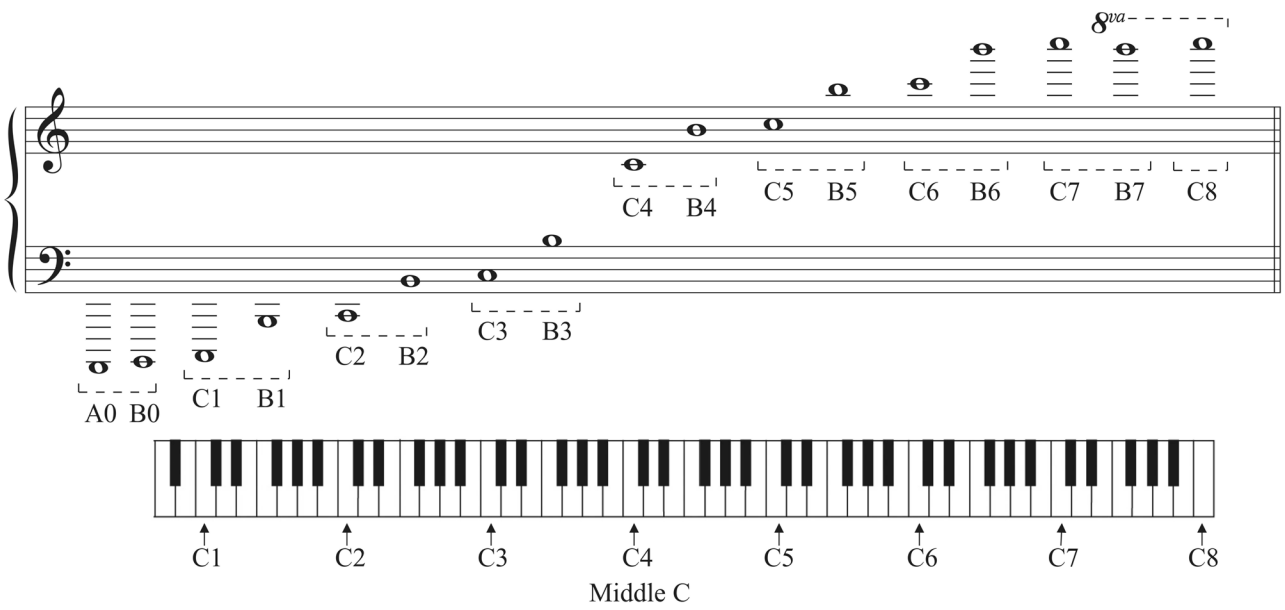
The *soprano, mezzo soprano,* and *baritone clefs* are C clefs used less often than the alto and tenor clefs. In each case the line indicated by the notch of the clef is designated as middle C.

## Octave Identification

Because the pitch spectrum is so wide, it is often necessary to identify a specific note by the *octave* in which it appears. Thus, middle C is distinguished from any other C in the pitch spectrum by the written designation C4 (see Figure 1.9).

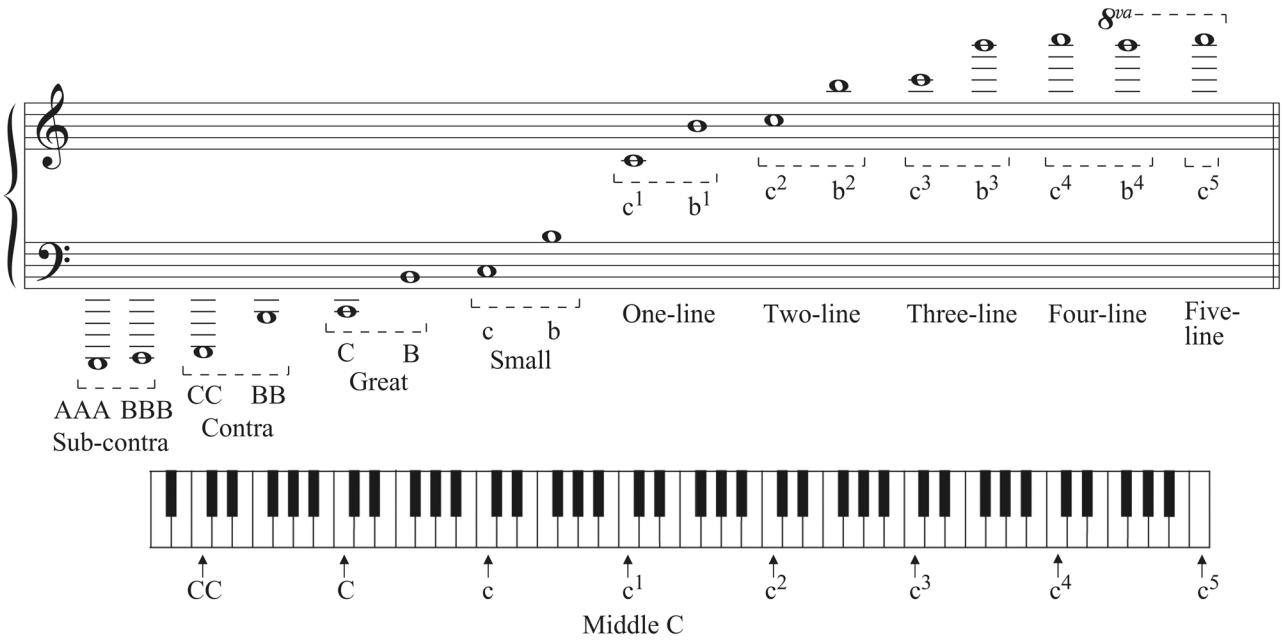
The system of octave identification in Figure 1.9 is recommended by the International Acoustical Society and is used in Braille music notation. Each octave of this system is numbered, beginning with A0 for the lowest note on the piano and extending to C8 for the highest note on the piano. Although the system shown in Figure 1.9 is used throughout this book, your instructor may prefer the system shown in Figure 1.10.

Figure 1.9




The *8va* above the right portion of the treble staff in Figure 1.9 means that the pitch sounds an octave above the written note. This symbol is used when a large number of ledger lines make note reading difficult. A related symbol, *8va bassa* (the *8va* symbol positioned below the bass-clef staff), is used to indicate when a pitch sounds an octave below the written note. Sometimes music copyists use *8vb* as a shorthand symbol to represent *8va bassa*.

Figure 1.10



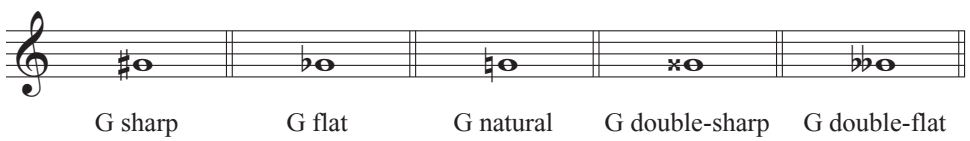

The octave identification system in Figure 1.10 is often referred to as the Helmholtz system, after the German acoustician who made the system popular. This widely used designation method has been prevalent since the nineteenth century.

## Accidentals

*Accidentals* are symbols that are placed to the left of the noteheads to indicate the raising or lowering of a pitch.

*Sharp* (♯)—raises the pitch a half step.
*Flat* (♭)—lowers the pitch a half step.
*Natural* (♮)—cancels any previous sharp or flat and returns to the natural, or unaltered, pitch.
*Double Sharp* (𝄪)—raises the pitch two half steps.
*Double Flat* (𝄫)—lowers the pitch two half steps.

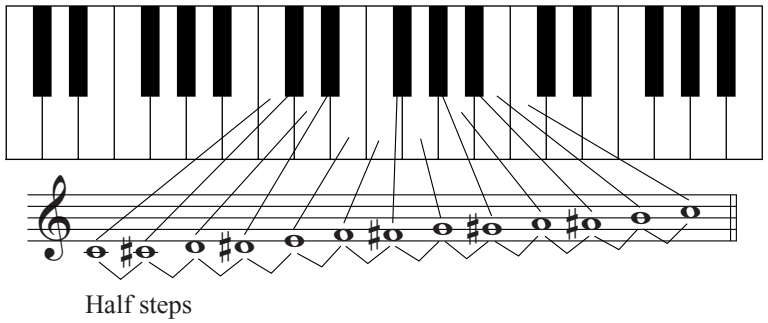
Figure 1.11




## Interval

An *interval* is the relationship between two tones. In Western music, the half step is the smallest interval used. It is the interval between any two adjacent keys—black or white—on the keyboard.

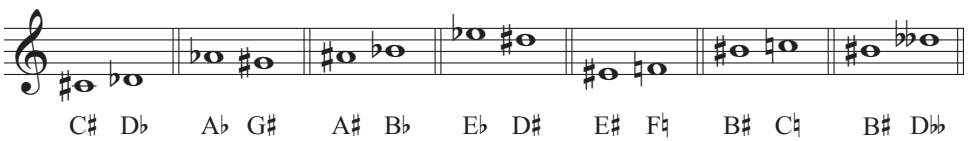
Figure 1.12




## Enharmonic Equivalents

*Enharmonic equivalents* are tones that have the same pitch but different letter names.

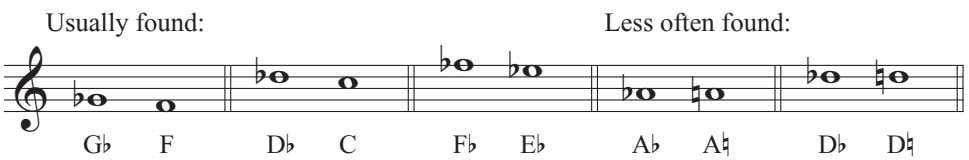
Figure 1.13




## Half-Step Motion

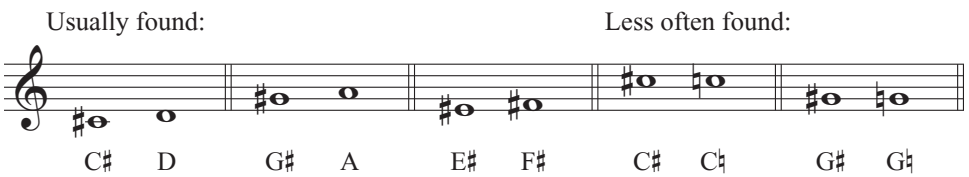
In passages of music involving *half-step motion,* a flatted note is followed most often by a note with a different letter name a half step lower.

Figure 1.14




A sharped note is followed most often by a note with a different letter name a half step higher in passages involving half-step motion.

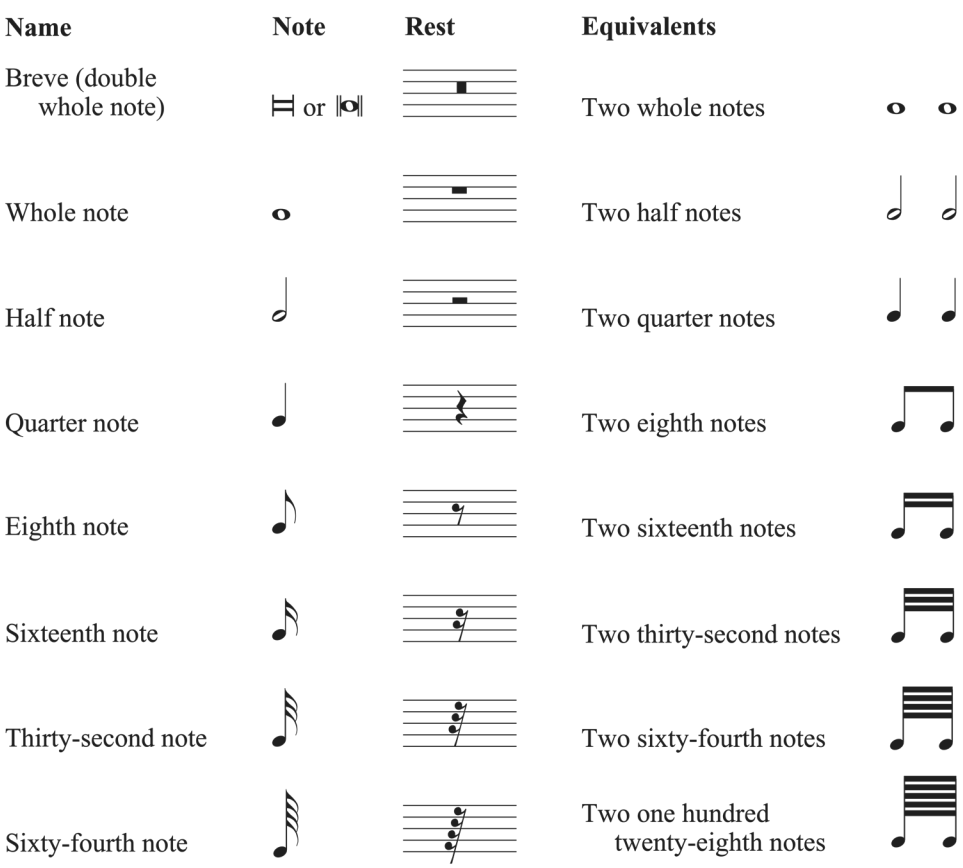
Figure 1.15




## Notation of Duration

Sounds and silences in music are represented by notes and rests. The notation of *duration*—the length of time a note or rest lasts—is illustrated in the following chart:

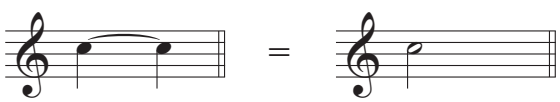
Figure 1.16




## The Tie

The *tie* is a curved line that connects two adjacent notes of the same pitch into a single sound with a duration equal to the sum of both note values.

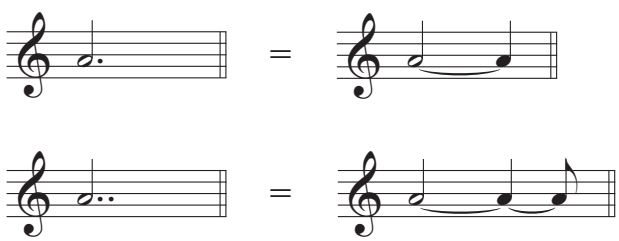
Figure 1.17



## The Dot

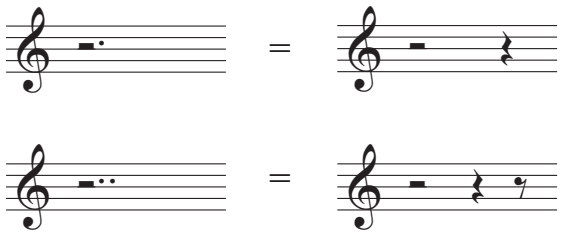
Placed to the right of a notehead, the *dot* lengthens the value of the note by half again its value. A *second dot* lengthens the dotted note value by half the length of the first dot.

Figure 1.18



Dots may also be used with rests and affect them in the same way.

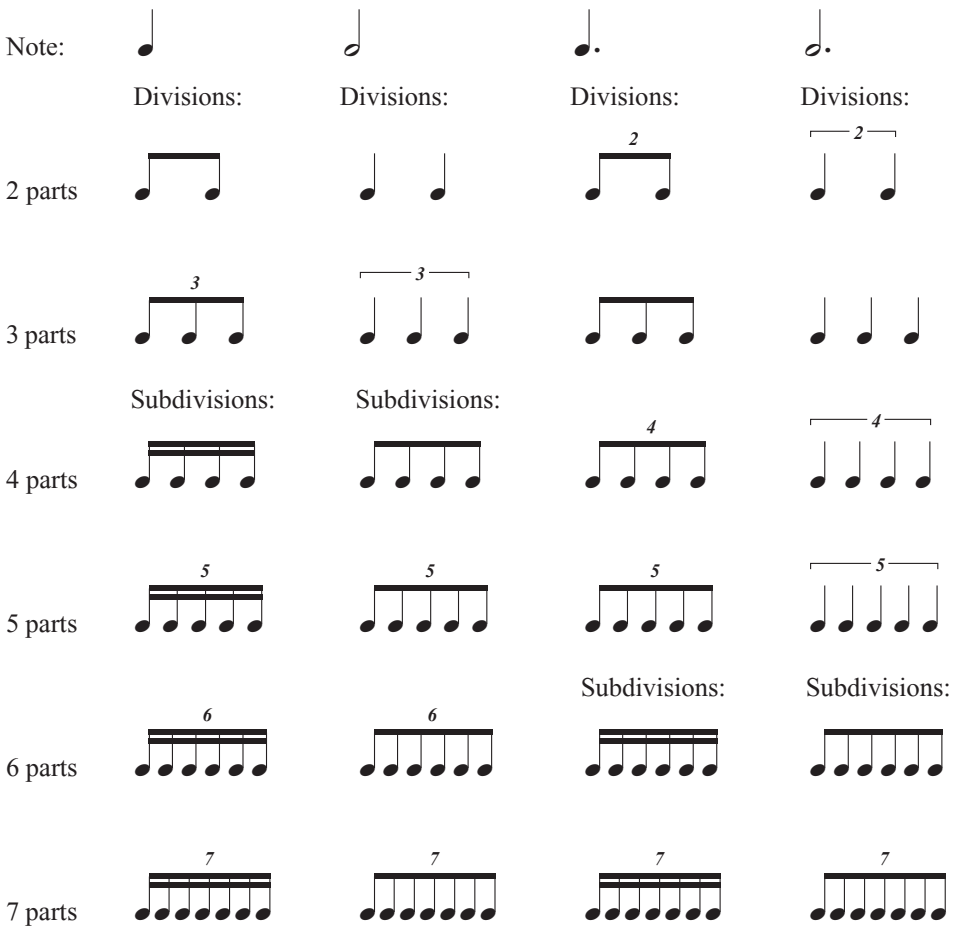
Figure 1.19



## Irregular Division of Notes

A note value may be divided or subdivided into any number of equal parts, as shown in the chart in Figure 1.20. Those divisions and subdivisions that require added numbers are called *irregular divisions* and *subdivisions.*

Figure 1.20



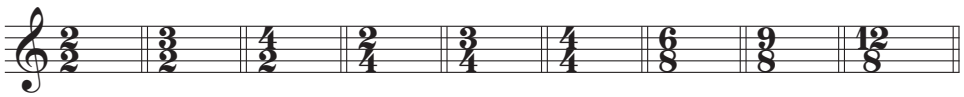

## Rhythm

*Rhythm* is a general term used to describe the motion of music in time. The fundamental unit of rhythm is the *pulse* or *beat.* Even persons untrained in music generally sense the pulse and may respond by tapping a foot or clapping.

## Meter Signatures

*Meter* can be defined as a regular, recurring pattern of strong and weak beats. This recurring pattern of durations is identified at the beginning of a composition by a *meter signature* (time signature).

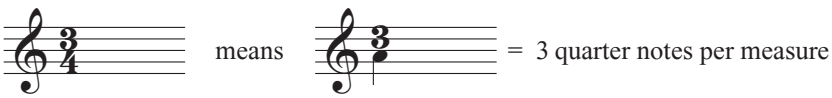
Figure 1.21



The upper digit indicates the number of basic note values per measure. It may or may not indicate the number of pulses per measure (as we will see later in compound meters).

The lower digit indicates a basic note value: **2** signifies a half note, **4** refers to a quarter note, **8** to an eighth note, and so forth.

Figure 1.22

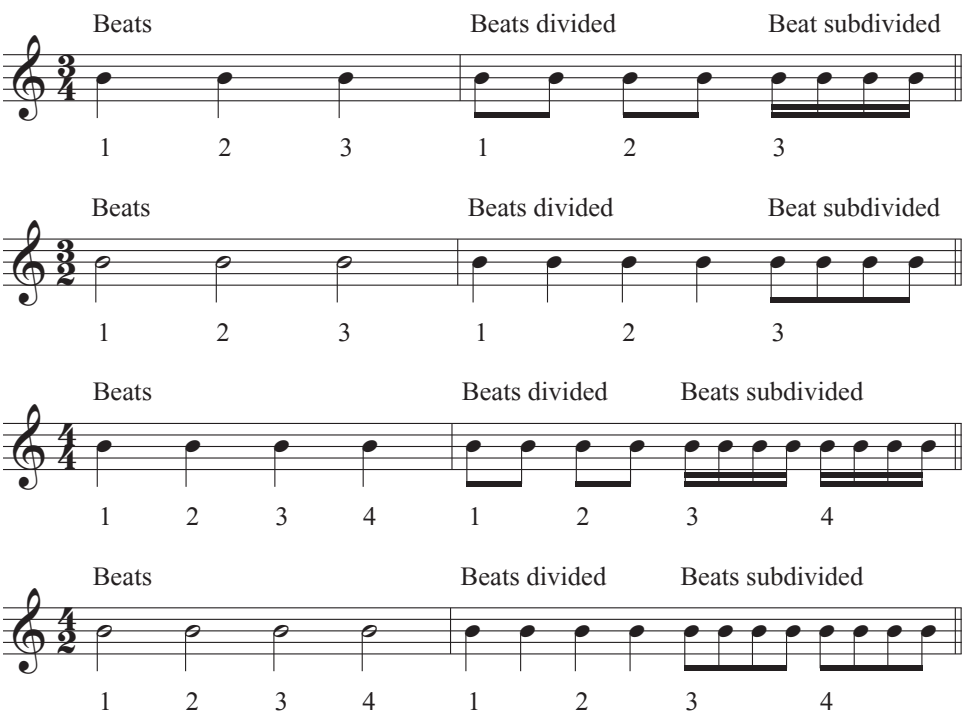



Although meter is generally indicated by time signatures, it is important to realize that meter is not simply a matter of notation.

***Simple Meter***

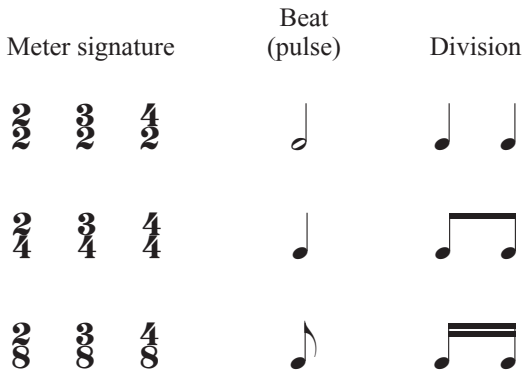
In *simple meter,* each beat is divided in two parts (simple division). The upper numbers in simple meter signatures are usually **2**, **3**, or **4** indicating two, three, or four basic pulses. Some simple meters showing the division of the beat are shown in Figure 1.23.

Figure 1.23




The basic pulse in simple meter will be some kind of a note value that is *not* dotted:

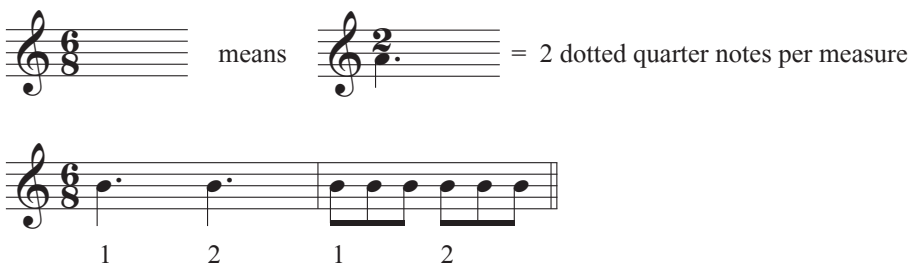
Figure 1.24




### Compound Meter

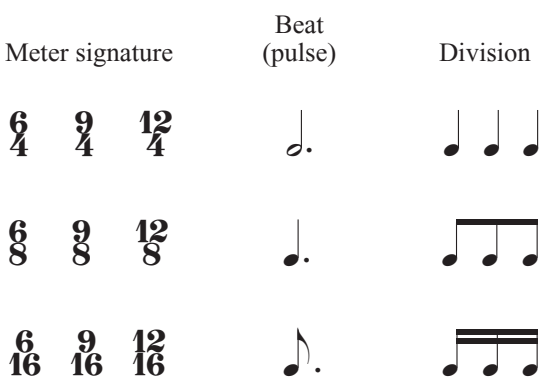
In *compound meter,* each pulse is a dotted note, which is divided into groups of three parts (compound division). The upper numbers in compound meter signatures are usually **6**, **9**, and **12**. In compound meter signatures, the lower number refers to the division of the beat, whereas the upper number indicates the number of these divisions per measure.

Figure 1.25



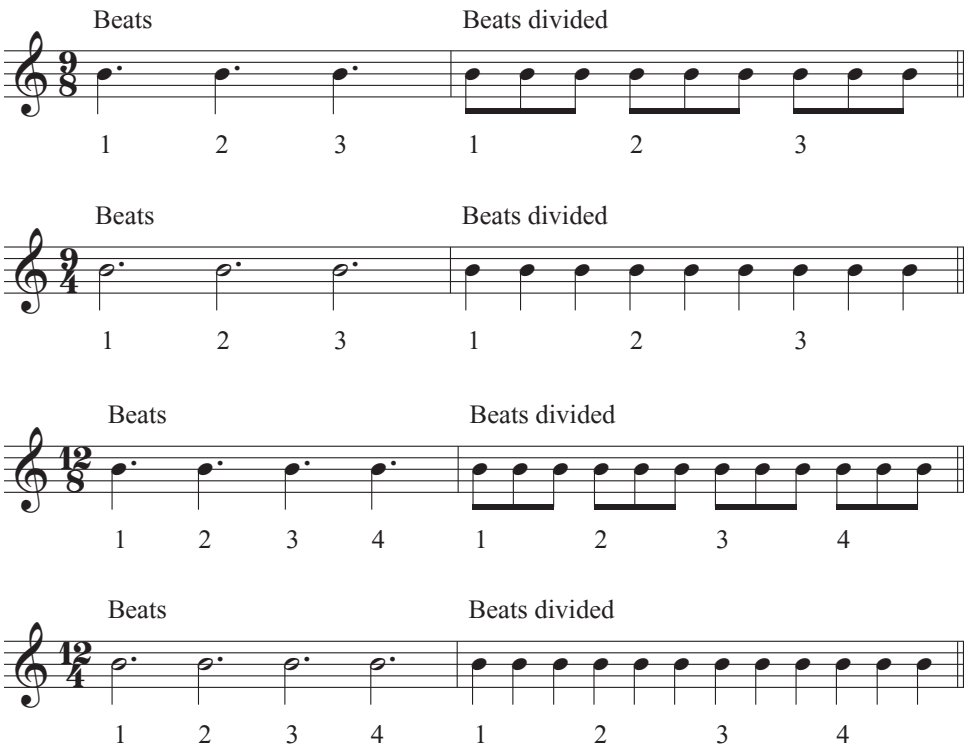

Note that the basic pulse in compound meter will be some kind of dotted note value:

Figure 1.26




In $\frac{6}{8}$ meter there are only two basic pulses, in $\frac{9}{8}$ meter there are three, and in $\frac{12}{8}$ meter there are four.

Figure 1.27




### Duple, Triple, and Quadruple Meters

Both simple and compound meters will have two, three, or four recurring pulses. Meters are identified as *duple* if there are two basic pulses, *triple* if there are three, or *quadruple* if there are four. These designations are often combined with the division names to describe a meter. For example, $\frac{2}{4}$ is a "simple duple" meter, and $\frac{6}{8}$ is a "compound duple" meter.

Figure 1.28

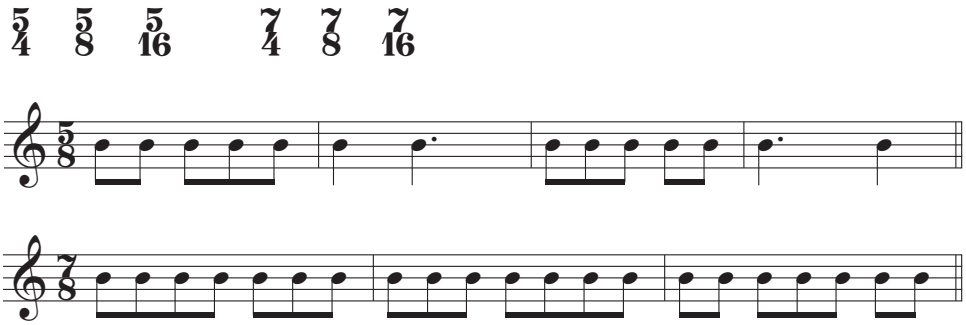
| | Simple meters | | | Compound meters | | |
|---|---|---|---|---|---|---|
| Duple meters | $\frac{2}{4}$ | $\frac{2}{2}$ | $\frac{2}{8}$ | $\frac{6}{8}$ | $\frac{6}{4}$ | $\frac{6}{16}$ |
| Triple meters | $\frac{3}{4}$ | $\frac{3}{2}$ | $\frac{3}{8}$ | $\frac{9}{8}$ | $\frac{9}{4}$ | $\frac{9}{16}$ |
| Quadruple meters | $\frac{4}{4}$ | $\frac{4}{2}$ | $\frac{4}{8}$ | $\frac{12}{8}$ | $\frac{12}{4}$ | $\frac{12}{16}$ |

### Asymmetrical Meters

The term *asymmetrical* means "not symmetrical" and applies to those meter signatures that indicate the pulse cannot be divided into equal groups of two, three, or four beats. The upper numbers in asymmetrical meters are usually **5** or **7**.

Figure 1.29

Asymmetrical meter signatures:

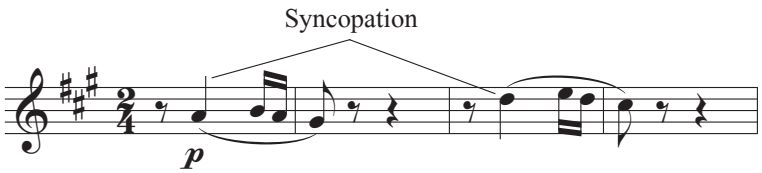


**Syncopation**

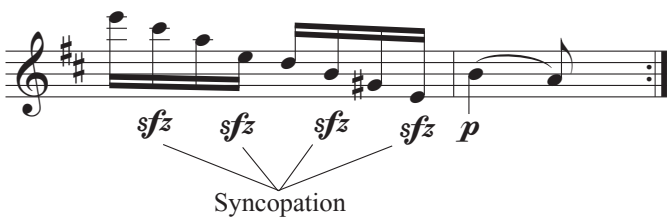
If a part of the measure that is usually unstressed is accented, the rhythm is considered to be *syncopated*.

Figure 1.30

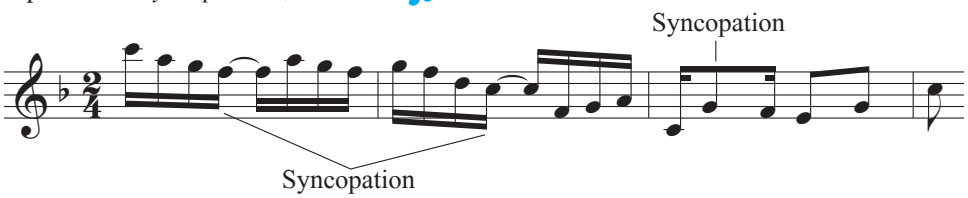
Beethoven: String Quartet in C-sharp Minor, op. 131, IV, mm. 1–4.




Beethoven: String Quartet in A Major, op. 18, no. 5, III, Variation I, mm. 7–8.




Joplin: *Elite Syncopations,* mm. 1–4.

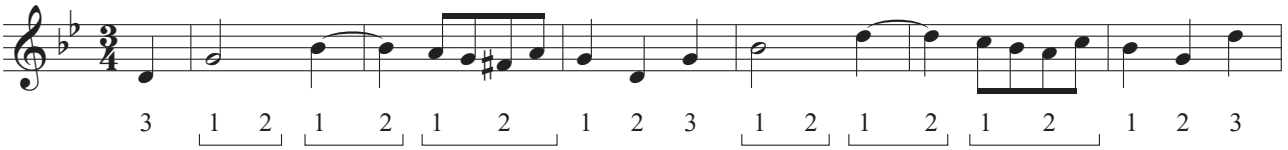



**Hemiola**

*Hemiola* occurs when shifting accents result in a departure from the traditional grouping of pulses in a meter. This device appears most frequently in meters containing groups of three (triple and compound meters) and is often the consequence of two groups of three being replaced with three groups of two. In Figure 1.31, hemiola occurs when adjacent measures in $\frac{3}{4}$ meter include three groups of two beats.

Figure 1.31

Mozart: Symphony no. 40 in G Minor, K. 550, III: Menuetto, mm. 1–6.




## Dynamic Markings

*Dynamic markings* indicate the general volume (amplitude) of sound. Although imprecise, such marks denote approximate levels of intensity. The following words, abbreviations, and signs are common:

| Symbol | Term | Definition |
|---|---|---|
| *pp* | Pianissimo | Very soft |
| *p* | Piano | Soft |
| *mp* | Mezzo piano | Moderately soft |
| *mf* | Mezzo forte | Moderately loud |
| *f* | Forte | Loud |
| *ff* | Fortissimo | Very loud |
|  | Crescendo (cresc.) | Gradually become louder |
|  | Decrescendo (decresc.), or diminuendo (dim.) | Gradually become softer |
| *sfz*, *sf* | Sforzando, sforzato | Sudden accent on a single note or chord |
| *sfp* | Sforzando piano | Sudden accent followed immediately by soft |
| *fp* | Fortepiano | Loud followed immediately by soft |

## Tempo

The speed of the beat in music is referred to as the *tempo*. Written designations like *largo* and *allegro* indicate the general pace of music, whereas metronome markings provide precise information about beats per minute.

A summary of tempo marks and other expression labels appearing in this text are listed in Appendix D on pages 383–384.

## History

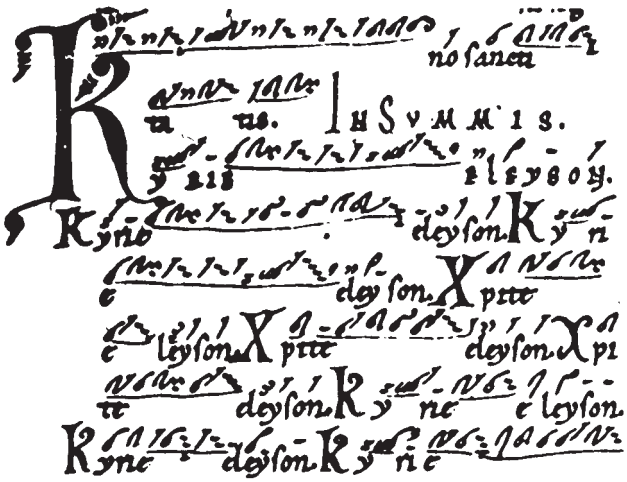
The notation of both pitch and duration has evolved over the centuries. It has been a gradual process of transformation that continues yet today.

### *Neumatic Notation*

From about 650 to 1200, music notation consisted of a set of symbols called *neumes* (pronounced "newms"). These symbols took their name from the general Latin use of the word *neuma* meaning *gesture*. Written above the Latin texts associated with the liturgy of the Christian church, neumes could not convey pitch or duration, but rather served as

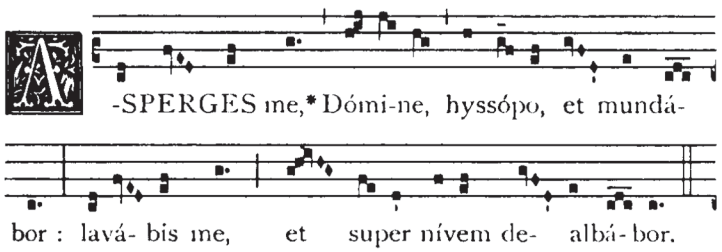
a memory aid in recalling previously learned melodic lines. Figure 1.32 is an example of neumatic notation from a twelfth-century manuscript.

Figure 1.32

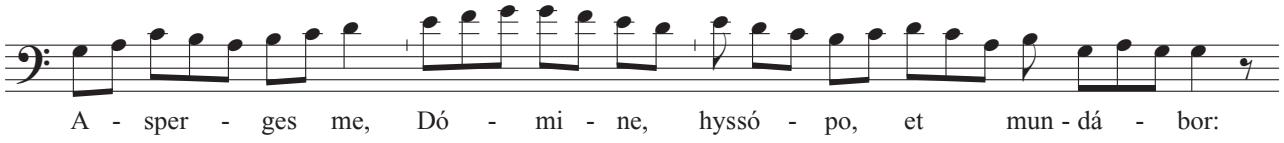


Horizontal lines were gradually added to indicate the locations of F and C. In the eleventh century, a four-line staff appeared that included the F line, the C line, and two additional lines. Later, neumes were square or diamond-shaped, as shown in Figure 1.33. Combined with the staff, neumes could now indicate specific pitches. The four-line staff is still used to notate Gregorian chant.

Figure 1.33




Transcribed into modern notation:




***Mensural Notation***

Mensural (measured) notation, a system that included durational values as well as pitch, developed during the thirteenth century as the single melody and free rhythm of Gregorian chant or plainsong gave way to measured music that included parts, descant, and, later, harmony and counterpoint. The *brevis* and *semibrevis* shown in Figure 1.34 are precursors to our modern-day breve and whole note.

Figure 1.34

Thirteenth-century mensural notation


### *Present Notation*

Our present system of notation evolved from thirteenth-century practices. A treatise on mensural notation, *De Musica Mensurabili* (*Ars Cantus Mensurabilis*), by Franco of Cologne (active 1250–1280), contains the fundamental rules of modern notation. Our notation system has developed gradually since the thirteenth century, and graphic details such as the shape of notes and clefs have changed. New symbols have been (and continue to be) invented as needed to better communicate the growing complexity of music.

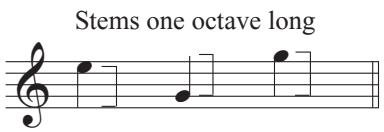
## Applications

The following series of directions highlight rudimentary elements of modern-day music notation. Whether you prepare a score by hand or with the assistance of music notation software, having a thorough knowledge of these standardized practices will ensure that the music you notate is represented correctly.

### Some Directions for Notation

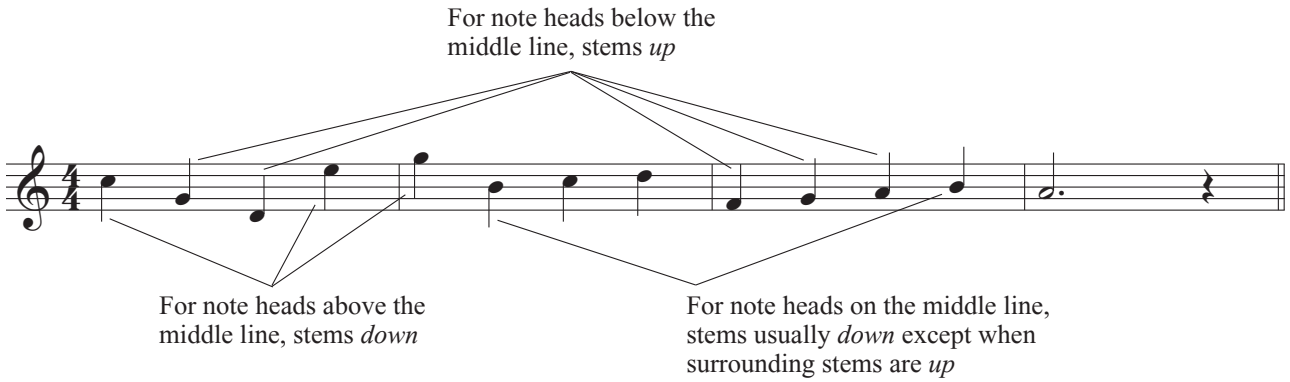
1. Noteheads are oval in shape and positioned on the staff lines and spaces at a slight upward slant. Stems are thin, vertical lines that are directly connected to the head. The stems of single notes within the staff should be about one octave in length.

Figure 1.35



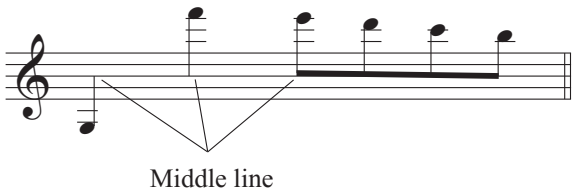

2. When a staff contains only a single melody, stems go down on those notes above the middle line and up on those notes below the middle line. When a note is on the middle line, the stem is usually down, except when the stems of adjacent notes are in the opposite direction.

Figure 1.36



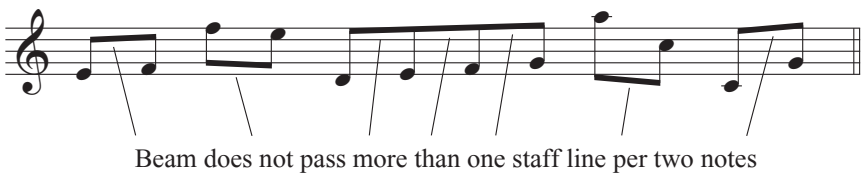
3. When stemmed notes are placed on ledger lines above or below the first ledger line, the stems should extend to the middle line of the staff.

Figure 1.37



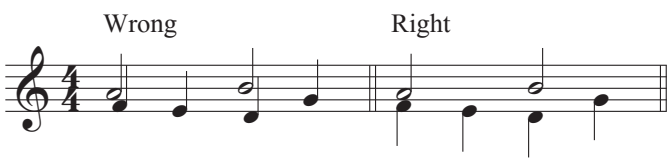

4. When connected by beams, stemmed notes should be modified so that the beams are slanted to cross no more than one line of the staff for each group of notes. Beams are slightly thicker than note stems.

Figure 1.38



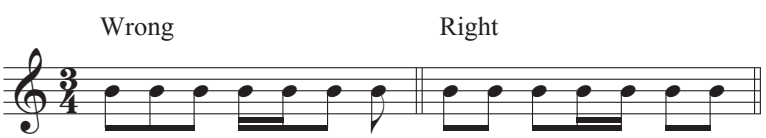

5. When two melodies occupy the same staff, the stems for one melody are up, and the stems for the other melody are down. This makes it possible to distinguish the melodies.

Figure 1.39



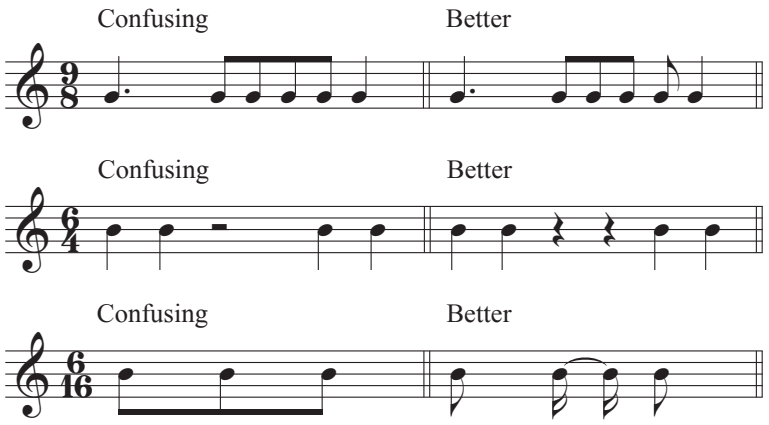

6. Beam groups of eighth notes (and smaller values) according to the beats in the measure.

Figure 1.40



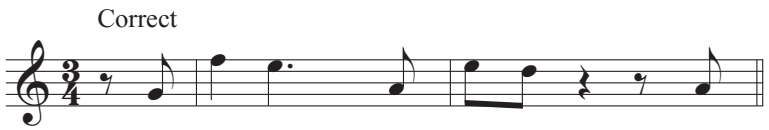

7. In compound meter, it is important to show the basic pulse structure of the measure and the division (of three) as clearly as possible.

Figure 1.41



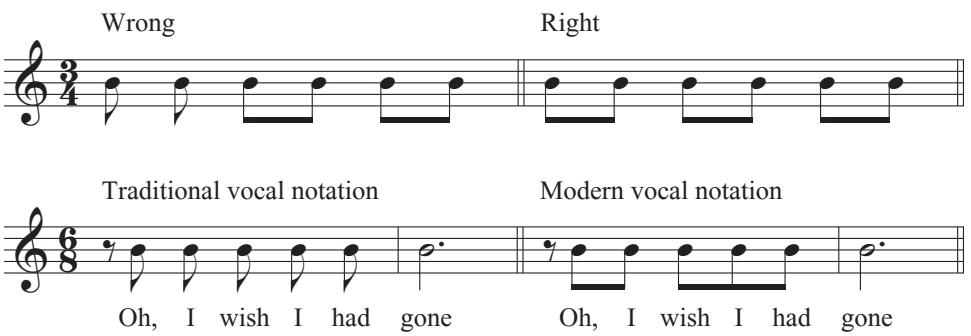

8. Use flags for eighth or shorter-value notes that are not grouped within a beat.

Figure 1.42



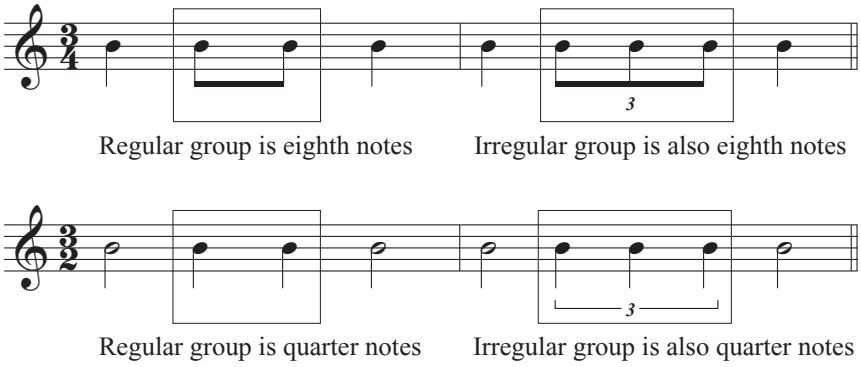

9. Connect no more than six notes by beams unless all are part of one beat.
10. Flagged and beamed notes are generally not mixed, except when notating vocal music. In vocal music, flagged notes have traditionally been used when the text–music relationship involves one note for each syllable. However, modern practice has moved toward the use of "instrumental" notation for vocal music.

Figure 1.43



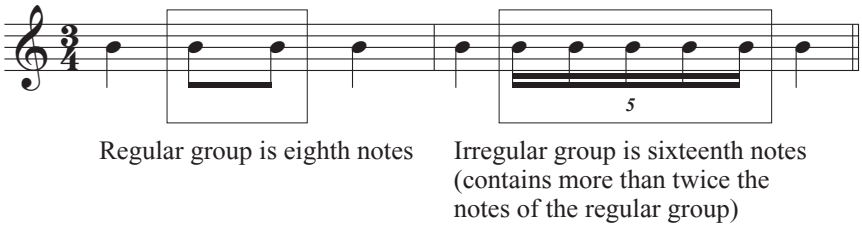

11. Irregular divisions of a beat or measure are indicated by showing the number of notes in the resulting group by means of an Arabic numeral. The note values of the irregular group are notated the same way as the regular group, provided the number of notes in the irregular group is less than twice that of the regular. For example, a triplet retains the same note values as a regular duplet.

Figure 1.44



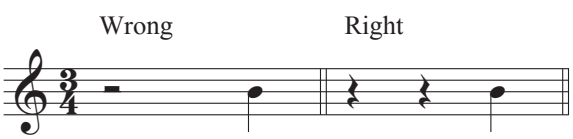

When the number of notes in the irregular group is more than twice the number of the regular, the next smaller note value is used; for example, a quintuplet would employ the next smaller note value.

Figure 1.45



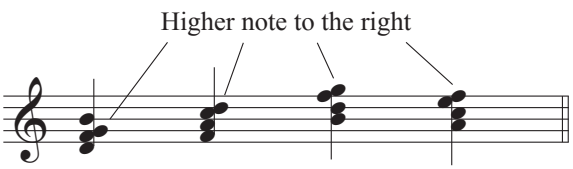

12. The whole rest can be used to indicate a full measure of rest in any meter.
13. Use two quarter rests rather than a half rest in $\frac{3}{4}$ meter.

Figure 1.46



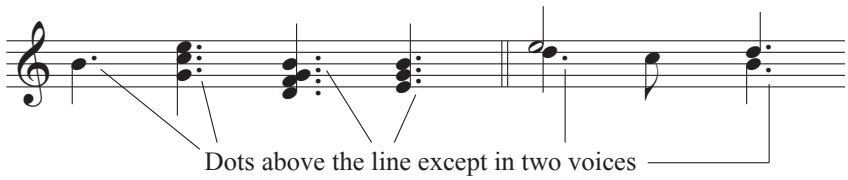

14. When notes of a chord are on an adjacent line and space, the higher of the two is always to the right, regardless of the direction of the stem.

Figure 1.47



15. When a dotted note is on a line, the dot is usually placed slightly above the line. When two separate voices are placed on a single staff, the dots are below the line on the notes with stems down.

Figure 1.48

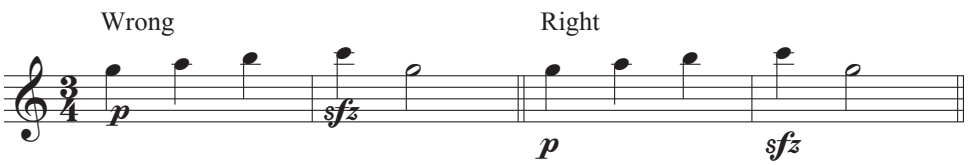



16. Dynamic markings should be added above, between, or below staves according to the nature of the music or score:

### Instrumental Music

The markings in *instrumental music* are usually placed beneath the staff to which they refer. Sometimes, because of inadequate space, it is necessary to place markings above the staff.

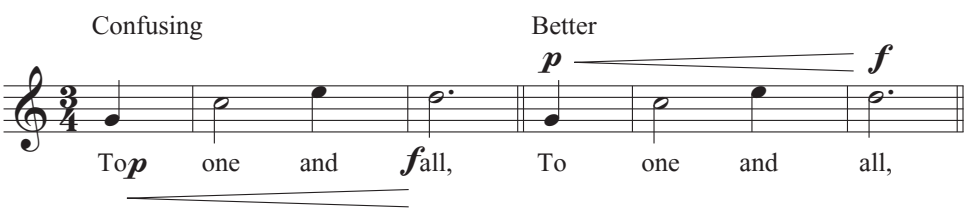
Figure 1.49




### Vocal Music

*Vocal music* markings are usually placed above the staff to which they refer. This is done to avoid confusion with the words of the lyrics.

Figure 1.50

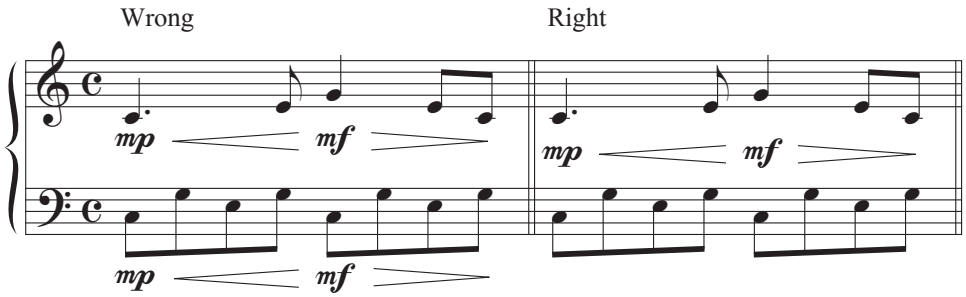



### Piano Scores

The markings in *piano scores* are placed between the staves if the markings are to apply to both staves. If markings are needed for each staff individually, the markings should go just above or below the staff to which they refer.

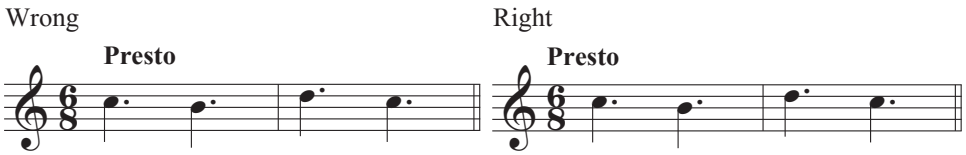
Markings should not be placed on the staff, although the crescendo and diminuendo will protrude into the staff on occasion.

Figure 1.51




17. Tempo markings should be added above the staff with the left side of the tempo mark lining up with the left side of the meter signature.

Figure 1.52




## Summary

When we notate music, we write symbols that represent three of the four properties of sound. Pitch and duration are represented simultaneously with precision, but intensity is indicated in relative terms. The rules for notating music are based on a system that has evolved over many centuries to represent the portrayal of sound and facilitate music performance.

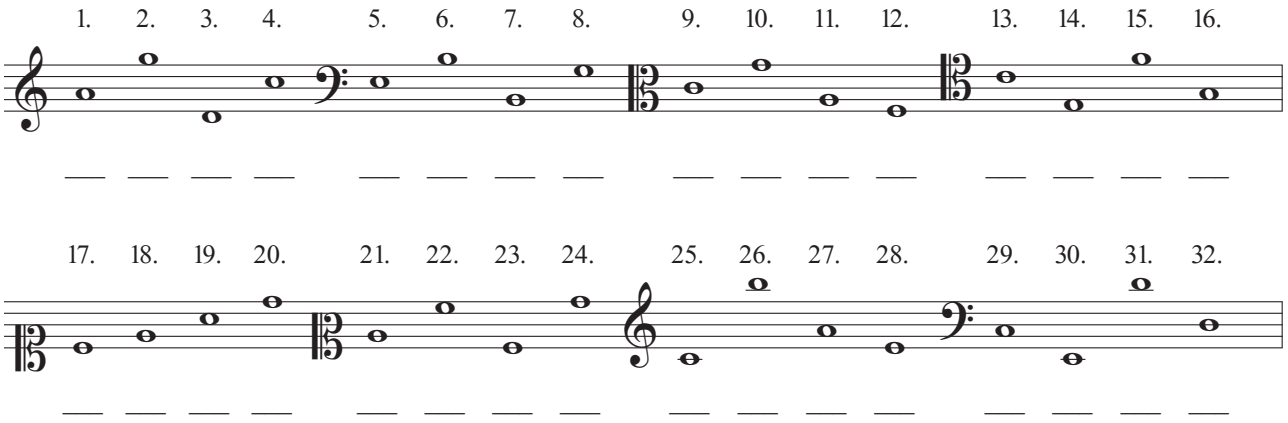
## Practice

Although the fundamentals of music notation are presented by category in this chapter, infinite combinations of the essential elements can be observed in published music scores. One of the simplest ways to understand common practices is to study a score and re-create the music notation.

Take a published music score—preferably a score to a composition you are currently studying in your lessons—and measure by measure, note for note, carefully re-create the notation on a piece of music manuscript paper. Observe all components carefully as you transfer the notation to your handwritten version. Be aware of spacing issues as you imitate the notation. Notice how the publisher adjusted the score to accommodate various notation factors. After you have completed your handwritten version of the score, play or sing your copy to check for errors or omissions.

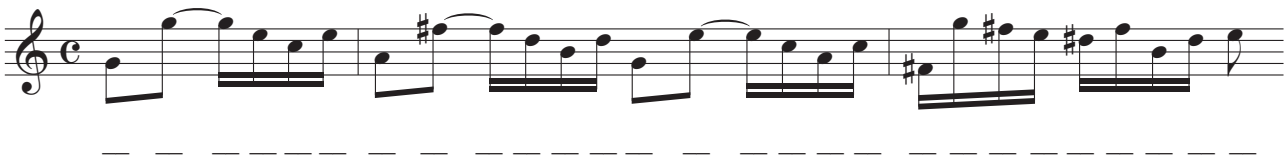
This type of practice can also be achieved by using music notation software. The important issue is to carefully reproduce all the notational elements in an accurate and readable format.

**Assignment 1.1** Write the letter name of each note in the blank below the staff.

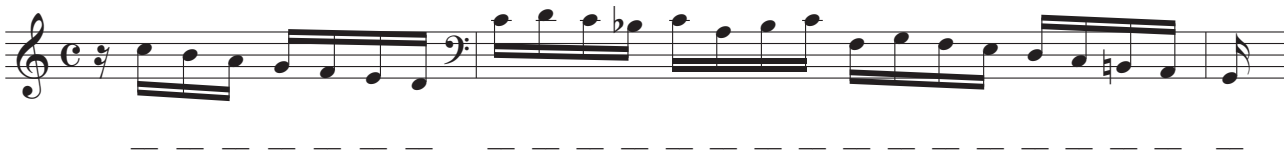



**Assignment 1.2** Write the letter name of each note in the blank below the staff.

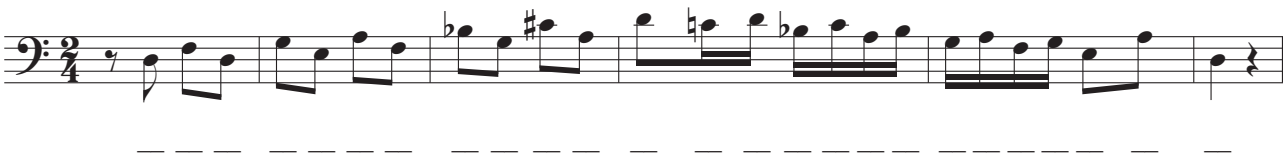
1. Bach: Invention no. 13 in A Minor, BWV 784, mm. 11–13.



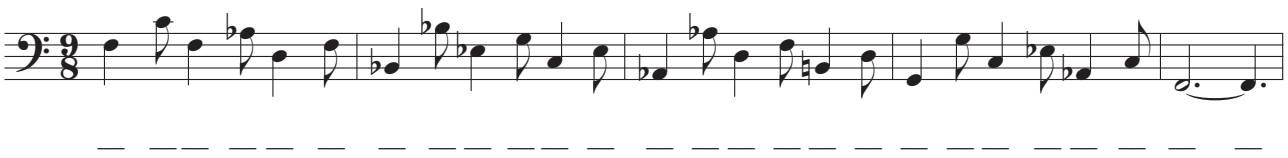
2. Bach: Sinfonia no. 1 in C Major, BWV 787, mm. 16–18.



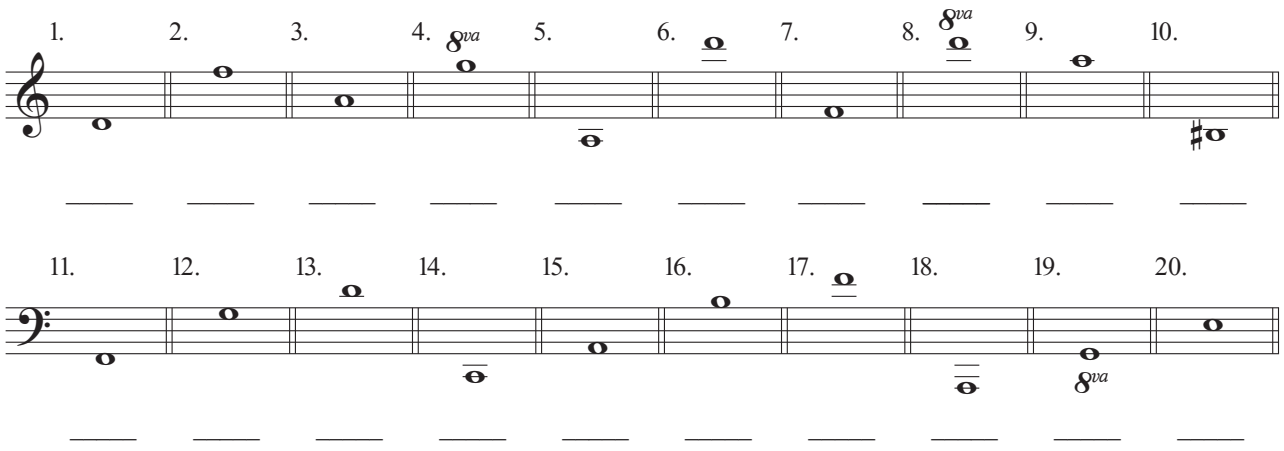
3. Bach: "Wir glauben all' an einen Gott" from *Clavier-Übung III*, BWV 680, mm. 4–9.



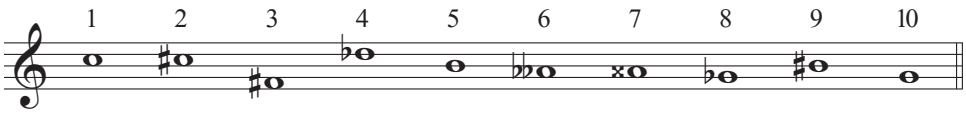
4. Bach: Prelude in C Major ("Leipzig"), BWV 547, mm. 68–72.



**Assignment 1.3** Write the letter name for each note and indicate the octave identification.




**Assignment 1.4** Below are 10 notes. Among them are five pairs of enharmonic equivalents (tones that have the same pitch but different letter names). Using the numbers below the staff, pair up the enharmonic equivalents.




No. _____ and No. _____ No. _____ and No. _____ No. _____ and No. _____

No. _____ and No. _____ No. _____ and No. _____

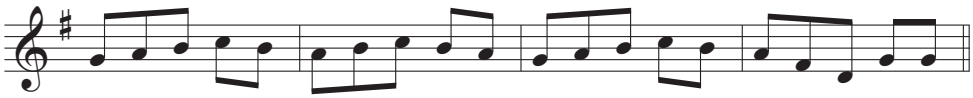
**Assignment 1.5** In the blanks provided, indicate whether the meter signatures are: (1) simple or compound, and (2) duple, triple, or quadruple.

| | | Simple or compound? | Duple, triple, or quadruple? | | | Simple or compound? | Duple, triple, or quadruple? |
|---|---|---|---|---|---|---|---|
| 1. | $\frac{3}{4}$ | | | 2. | $\frac{6}{8}$ | | |
| 3. | $\frac{9}{4}$ | | | 4. | $\frac{4}{2}$ | | |
| 5. | $\frac{3}{8}$ | | | 6. | $\frac{12}{16}$ | | |
| 7. | $\frac{6}{4}$ | | | 8. | $\frac{4}{8}$ | | |
| 9. | $\frac{2}{2}$ | | | 10. | $\frac{9}{8}$ | | |

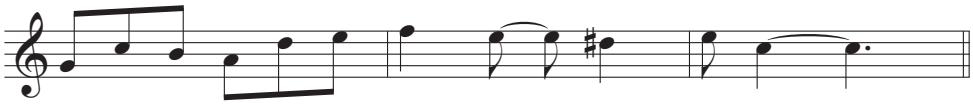
## Assignment 1.6

Following are five melodies without meter signatures. Indicate the meter signature or, in some cases, the two meter signatures that render the notation correct.

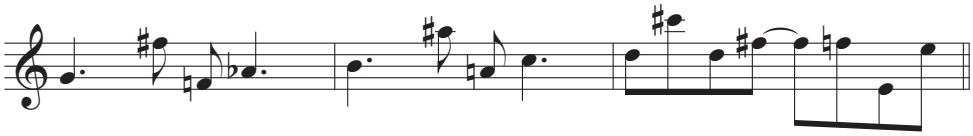
1. _____



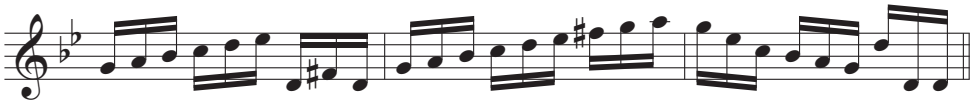
2. _____



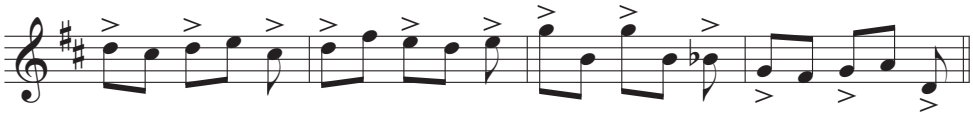
3. _____



4. _____



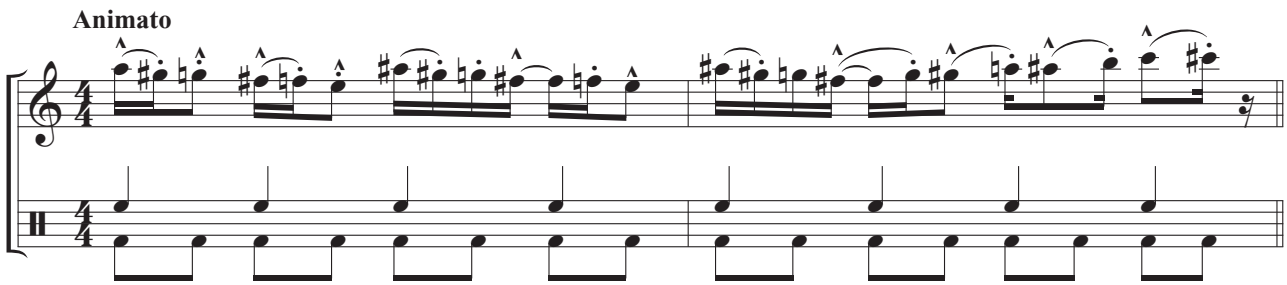
5. _____



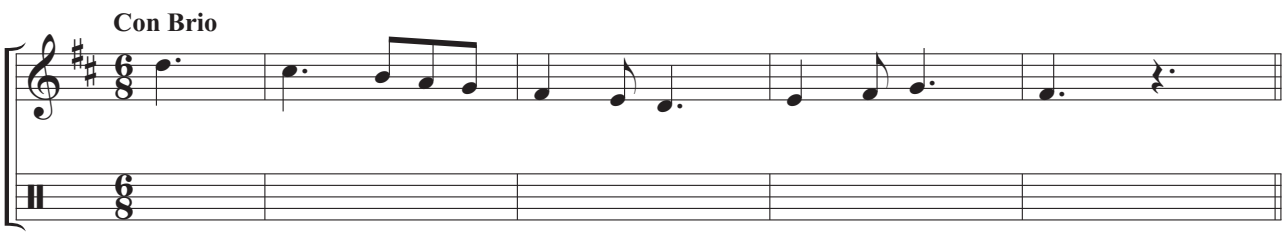
## Assignment 1.7

On the staff below each melody, write the pulse in single note values on the top space and the division of the pulse on the bottom space of the staff (see example). Consider the tempo in making your decision. Play or sing each melody. The neutral clef at the beginning of each bottom staff means that no specific pitch is designated.

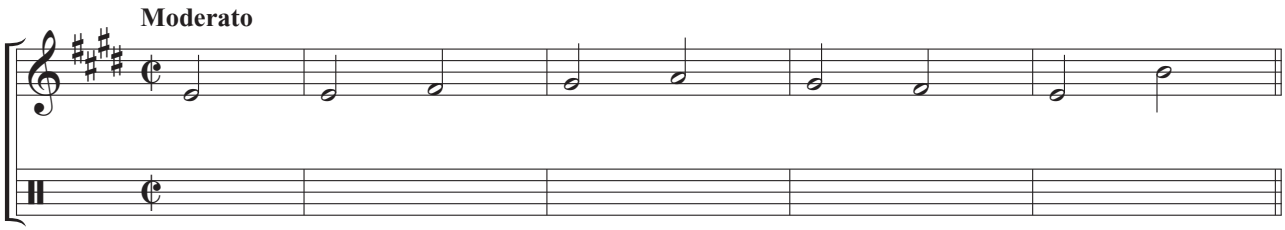
1. (Ex.) Ives: *Three Places in New England,* II: Putnam's Camp, Redding, Connecticut, mm. 107–108.



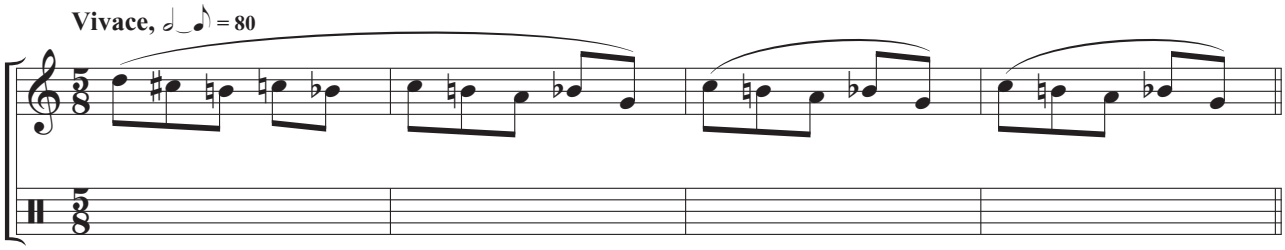

2. French Folk Song.



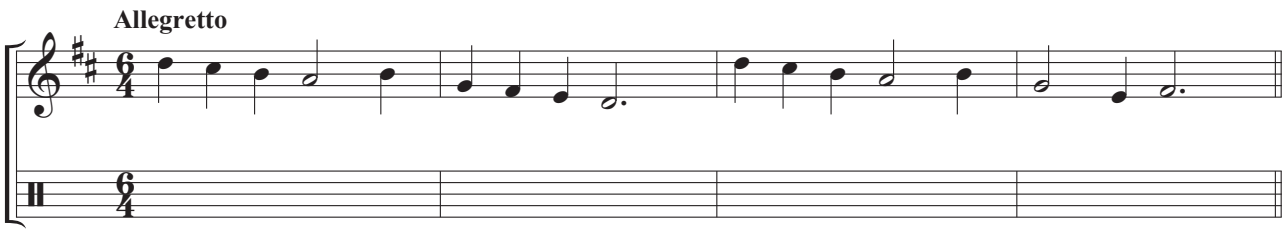
3. French Hymn Tune.



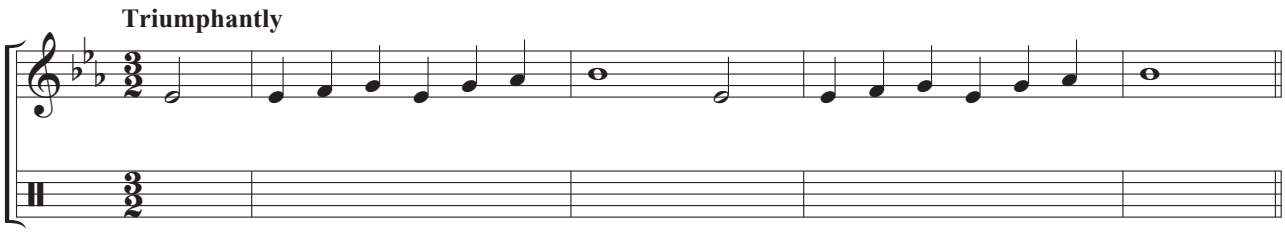

4. Bartók: "Bulgarian Rhythm" from *Mikrokosmos,* vol. IV, no. 115, mm. 25–28.



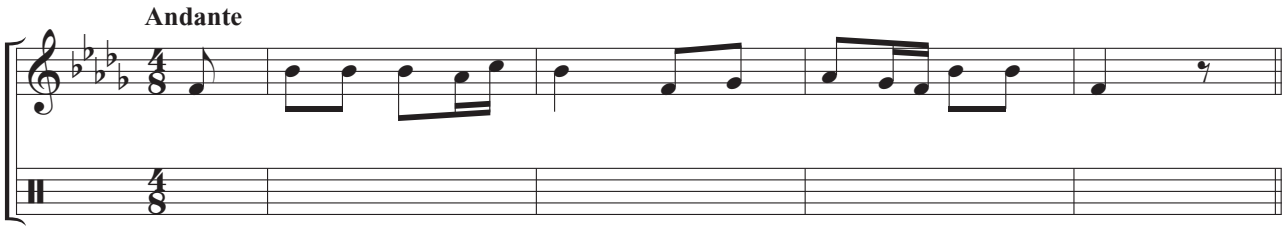

5. Dutch Folk Song.



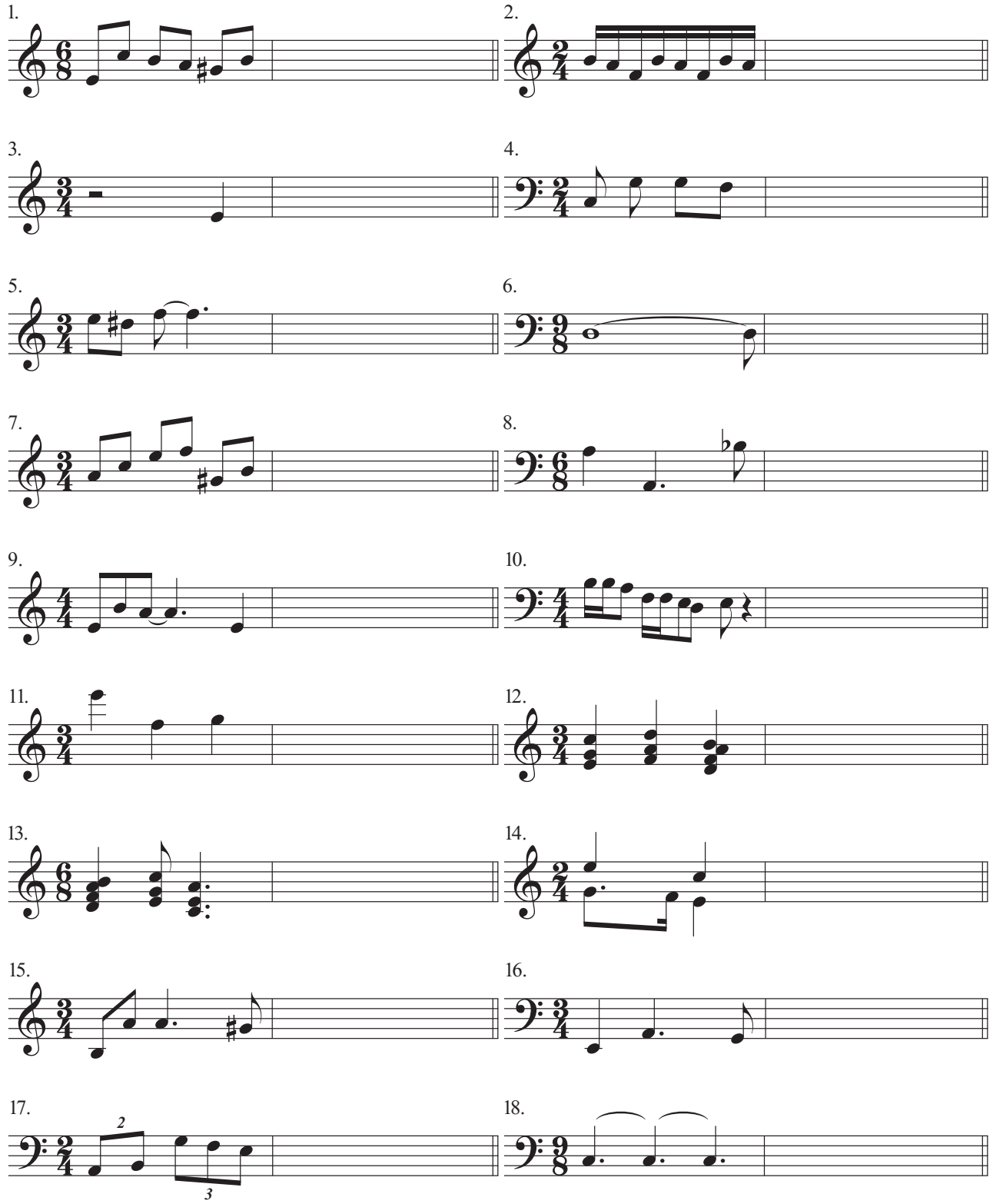

6. Chorale Tune: "All Creatures of Our God and King."




7. Finnish Folk Song.



**Assignment 1.8** Below are 18 measures of music. In each case, the notation is either confusing or incorrect. Rewrite each measure on the staff provided and clarify or correct the notation.

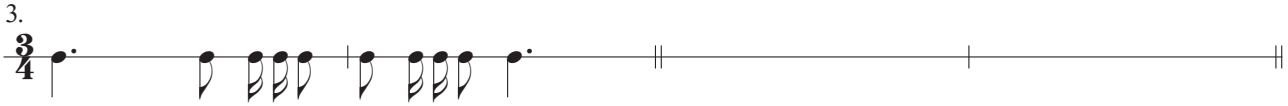


**Assignment 1.9** Each of the following rhythms lacks beams. Rewrite each rhythm and add beams to reflect the given meter signature.

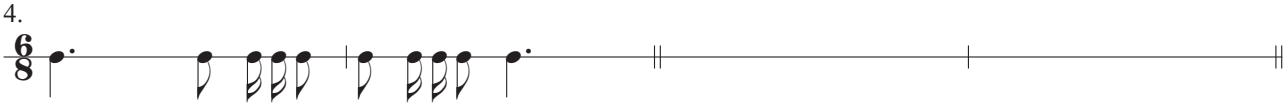
1.

2.

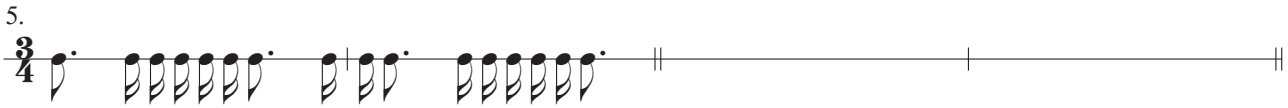
3.



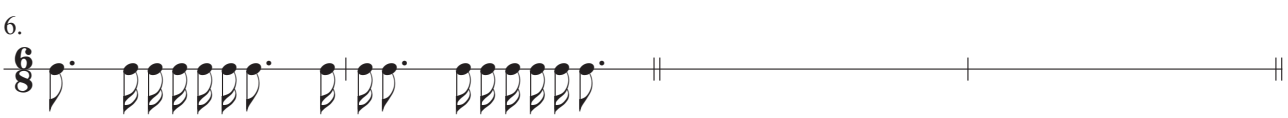
4.



5.



6.



**Assignment 1.10**

1. Select a meter signature from those on pages 10–14.
2. Write a measure in a rhythm you think is "catchy." Include or exclude pitch as you wish.
3. Play the rhythm in class and repeat it at least five times.
4. Ask each of the other members of the class (individually) to repeat your rhythm.
5. Ask each class member to notate the rhythm on score paper.
6. Decide whether each notation is correct or incorrect (even if it is different from your way of notating it).

**Assignment 1.11**

1. Write a rhythmic composition of 16 measures that contains rhythmic patterns, each lasting two measures and repeated once. Continue these patterns through the 16 measures. You should end up with four different rhythmic patterns, each repeated once.
2. Add pitches or make your composition exclusively rhythmic—as you wish.
3. Play your 16-measure composition in class. Repeat it several times.
4. Appoint individual class members to remember each of the four rhythms in your composition—one class member per rhythm.
5. Ask these four members to play your four rhythms, each playing the rhythm you asked the individual to remember and in the same order you had played them, of course.

CHAPTER 2

# Scales, Tonality, Key, Modes

**Topics**

Scale
Pitch Class
Diatonic Scales
Tonic
Scale Degree Names
Major Scale
Tetrachord
Transposition
Key Signature
Natural Minor Scale
Harmonic Minor Scale
Melodic Minor Scale
Relative Minor
Relative Major
Circle of Fifths
Parallel Relationship
Tonality
Key
Pentatonic Scale
Nondiatonic Scales
Chromatic Scale
Whole-Tone Scale
Blues Scale
Octatonic or Diminished Scale
Mode
Solfeggio
Pitch Inventory

**Important Concepts**

Performers often practice scales to develop their technique. The collections of pitches and recurring patterns instrumentalists and vocalists use to cultivate technical proficiency are the same building blocks composers employ to create musical compositions.

## Scale

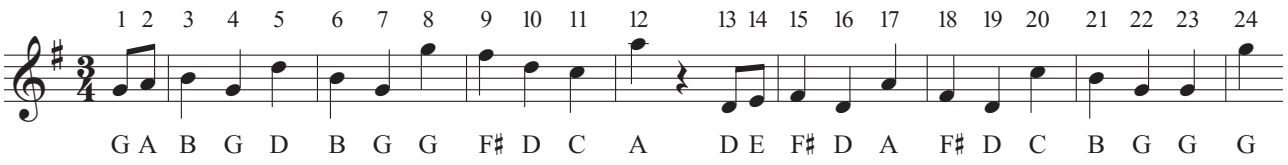
A *scale* is a collection of pitches in ascending and descending order. Musicians use a scale as a convenient way of displaying the notes used in a melody or harmony. In Figure 2.1, the melody consists of 24 notes but only seven different letter names.

## Pitch Class

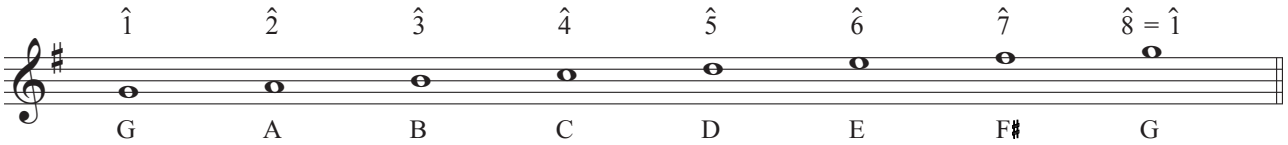
A *pitch class* contains all notes of the same name regardless of octave. The pitch classes for the melody in Figure 2.1 are arranged in ascending order to form a scale. The caret (ˆ) above each number indicates the scale degree (the position of the note within the scale).

Figure 2.1

Haydn: Symphony no. 94 in G Major ("Surprise"), III: Menuetto, mm. 1–8.




Notes of the melody arranged as a scale:



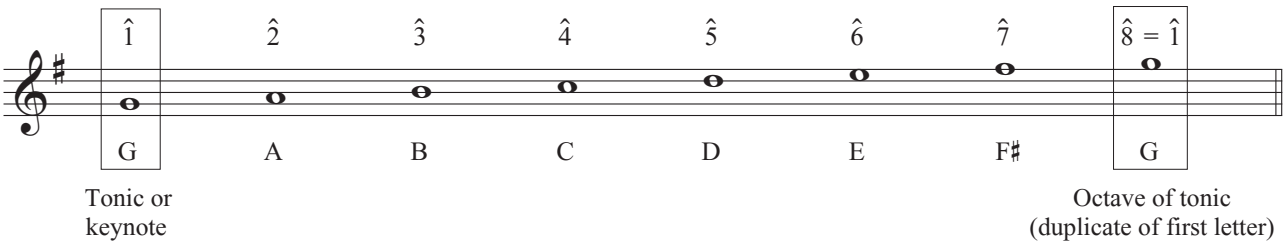
Although an infinite variety of pitch combinations is available, the scales presented in this chapter represent those in most common use during the past 200 years.

## Diatonic Scales

*Diatonic* (literally "across the tones") defines a scale of mixed half and whole steps (and an occasional step and a half) in which each individual tone plays a role. The first tone of a scale, the *tonic,* is a point of rest and is considered to be the most stable. Other tones lead toward or away from it, creating varying degrees of tension or relaxation.

Because the tonic is the focal point of the scale, the most stable note, and the point of greatest relaxation, diatonic melodies frequently end on the tonic note. At times the word diatonic is used to indicate a tone that is part of a particular scale pattern—as distinguished from a nondiatonic tone that does not belong to the scale pattern.

Figure 2.2



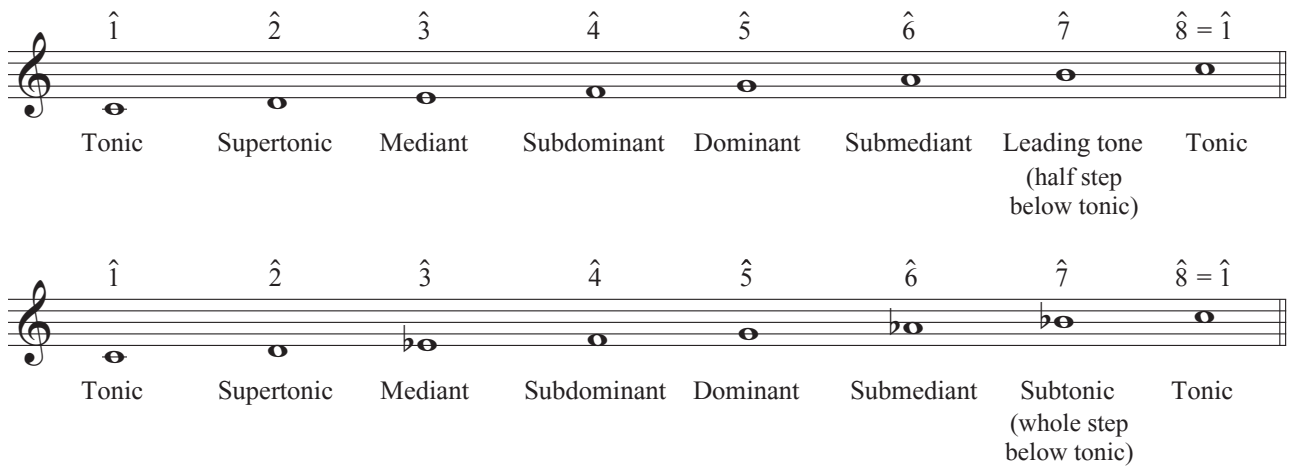

## Scale Degree Names

Each degree of the seven-tone diatonic scale has a *name* that relates to its function. The major scale and all three forms of the minor scale share these terms.

| Scale Degree | Name | Meaning |
|---|---|---|
| $\hat{1}$ | Tonic | Tonal center—the final resolution tone. |
| $\hat{2}$ | Supertonic | One step above the tonic. |
| $\hat{3}$ | Mediant | Midway between tonic and dominant. |
| $\hat{4}$ | Subdominant | The lower dominant—the fifth tone down from the tonic (also the fourth tone up from the tonic). |
| $\hat{5}$ | Dominant | So called because its function is next in importance to the tonic. |
| $\hat{6}$ | Submediant | The lower mediant—halfway between tonic and lower dominant (subdominant). The third tone down from the tonic (also the sixth tone up from the tonic). |
| $\hat{7}$ | Leading Tone | Strong affinity for and leads melodically to the tonic. Used when the seventh tone appears a half step below the tonic. |
| $\hat{7}$ | Subtonic | Used when the seventh degree is a whole step below the tonic. The seventh tone of the natural minor scale. |

Two different scales are shown in Figure 2.3 to illustrate the application of scale degree names to diatonic tones.

Figure 2.3

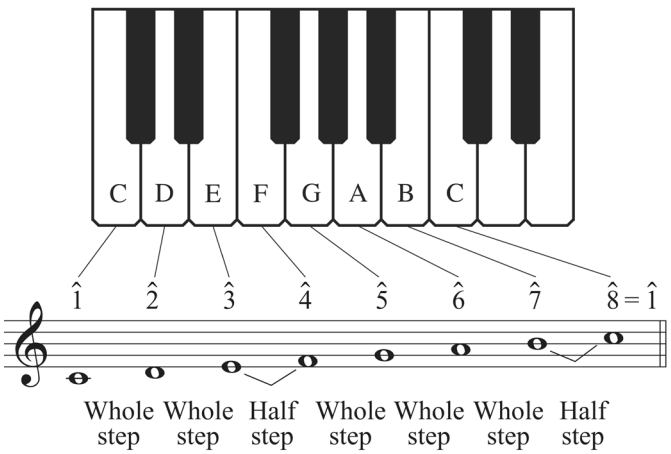



## Major Scale

The *major scale* is a scale of seven different pitch classes with whole steps separating adjacent tones, except for half steps between the third and fourth degrees and between the seventh and eighth (or first) degrees. The eighth pitch has the same letter name as the first and thus is treated as a duplication.

All adjacent keys on the piano are a half step apart. Figure 2.4 shows that by beginning on C and playing in order only the white keys to the next C, you build a *C major* scale.

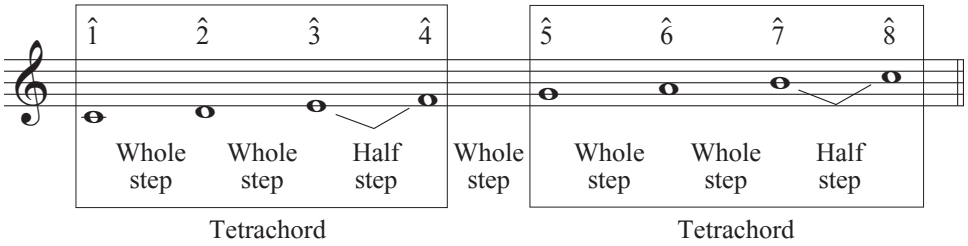
Figure 2.4




## Tetrachord

The major scale includes two *tetrachords* (groups of four pitches) constructed with the same arrangement of intervals—two whole steps followed by a half step. The two tetrachords of the major scale are separated by a single whole step (see Figure 2.5).

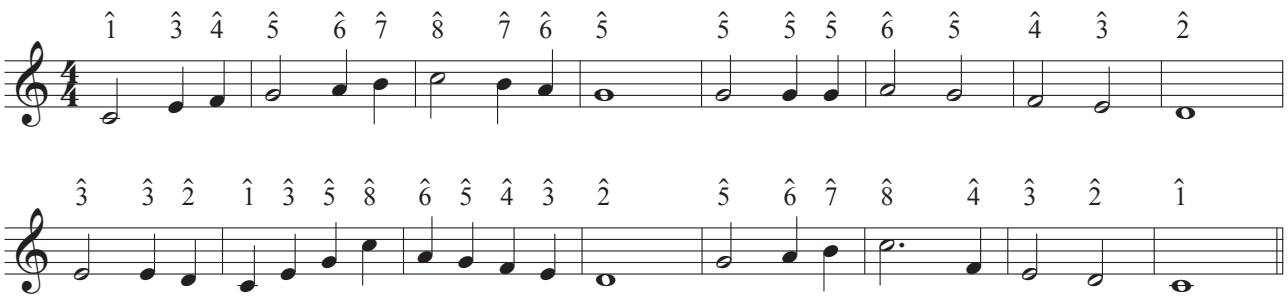
Figure 2.5




The melody in Figure 2.6 utilizes the notes of the C major scale.

Figure 2.6

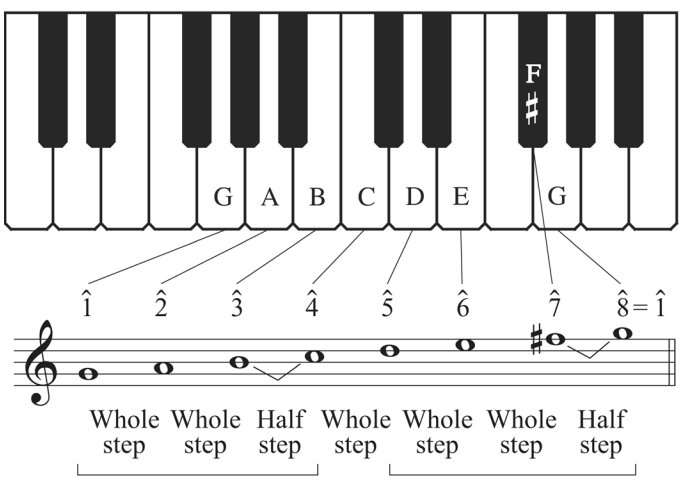
Hatton: "Duke Street."




## Transposition

This same major scale pattern of half and whole steps can be duplicated at any pitch. Such rewriting is called *transposition*. In Figure 2.7, the major scale is transposed so that its first tone is G. This is the G major scale.

Figure 2.7



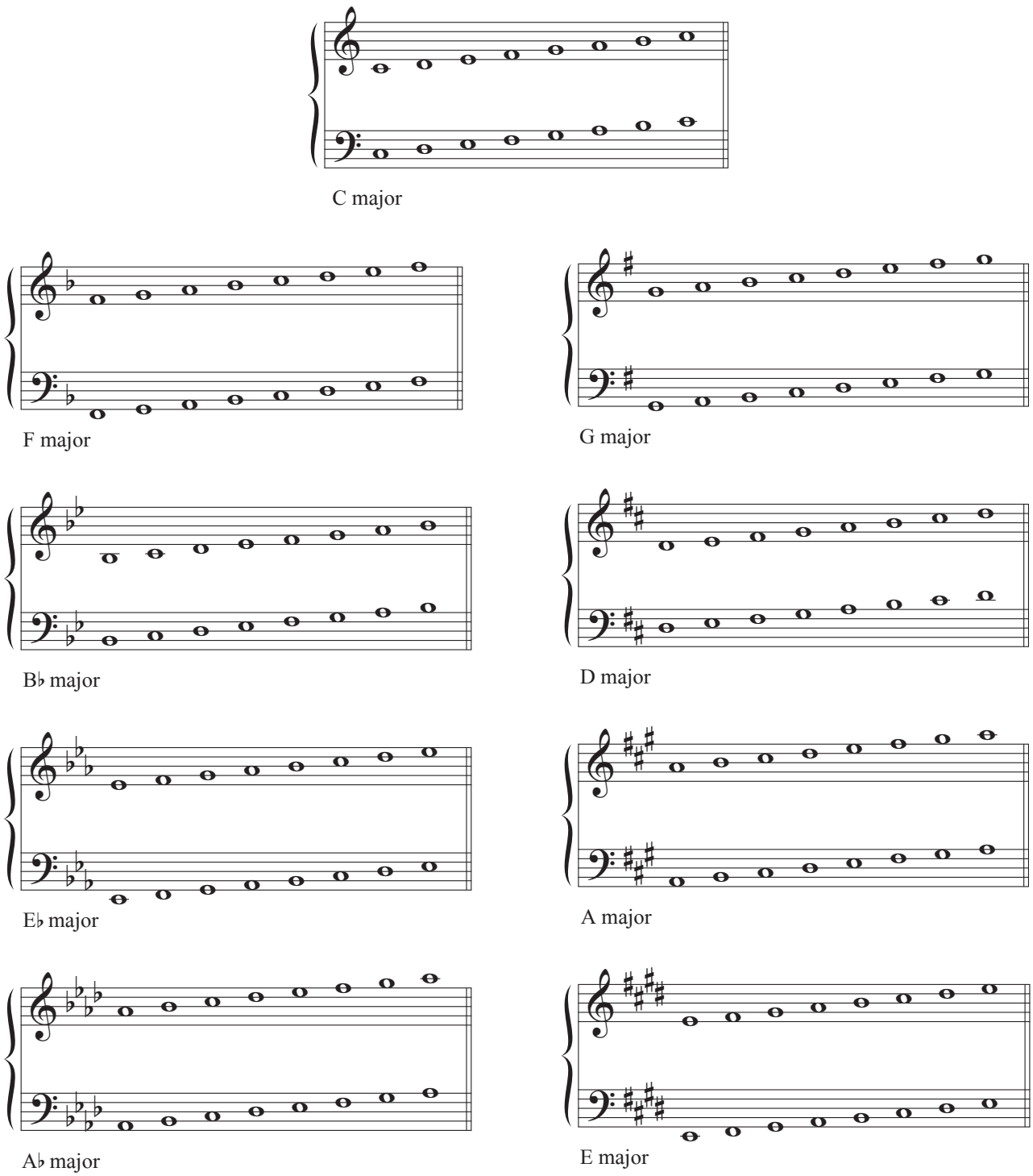

## Key Signature

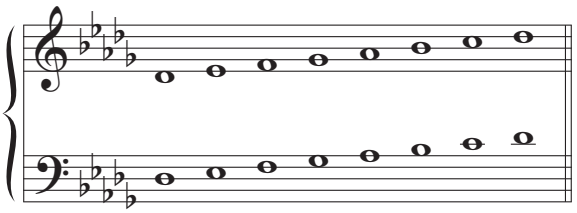
From Figure 2.7, it can be seen that a sharp is necessary if the major scale pattern of whole and half steps is to be carried out in the transposition. Figure 2.8 provides a convenient way to memorize the sharps or the flats needed when the scale begins on various pitches. The

arrangement of the necessary sharps or flats is called a *key signature* and appears at the beginning of each staff in a composition after the clef. Notice that each successive tonic, or beginning note, is five scale degrees (called a perfect fifth) above or four scale degrees below the previous tonic. A new sharp is added to the key signature for each ascending perfect fifth (P5); in the flat signatures, a flat is dropped for each ascending P5 (see Figure 2.20).

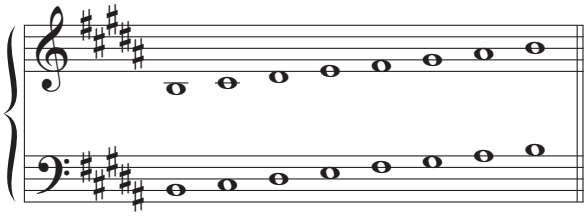
Figure 2.8

**Major Key Signatures**

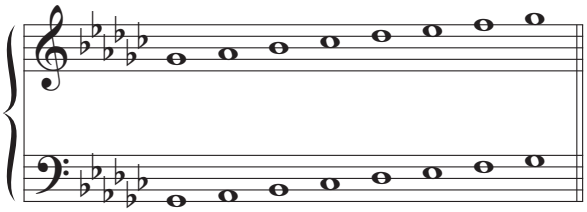




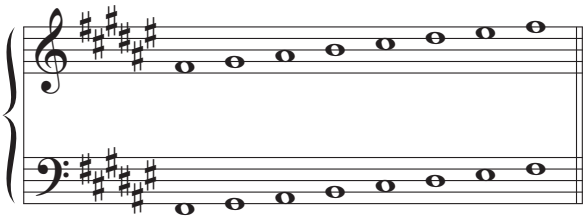
D♭ major



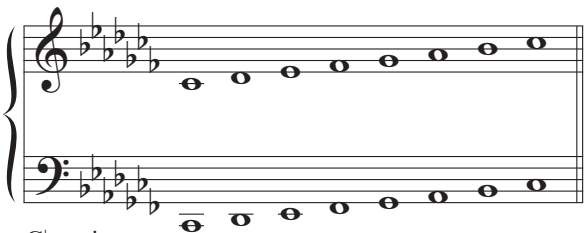
B major



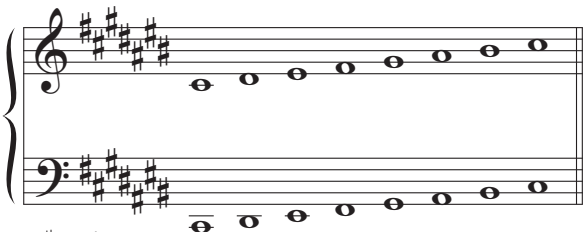
G♭ major



F♯ major



C♭ major



C♯ major

## Minor Scale

The *minor scale* is another common diatonic scale. It is more varied in pitch material because there are two versions of both the sixth and seventh scale degrees. Traditionally, the minor scales have been described as having three distinct forms, but in practice, composers use all the scale resources of the minor scale within a single composition. The three traditional forms of the minor scale are called natural, harmonic, and melodic.

### *Natural Minor Scale*

The *natural minor scale* contains seven different pitches with whole steps separating adjacent tones, except for half steps between the second and third degrees and between the fifth and sixth degrees. Its pitches are those of the white keys of the piano from A to A:

Figure 2.9