


Bruce Benward & Marilyn Saker

# Music

IN THEORY AND PRACTICE

Ninth Edition  VOLUME I

# Music

---

IN THEORY AND PRACTICE

VOLUME I

*This page intentionally left blank*

# Music

---

IN THEORY AND PRACTICE

VOLUME I

Ninth Edition

**Bruce Benward**

*Late of the University of Wisconsin–Madison*

**Marilyn Saker**

*Eastern Michigan University*

**Mc  
Graw  
Hill**  
Education



MUSIC IN THEORY AND PRACTICE, VOLUME I, NINTH EDITION

Published by McGraw-Hill Education, 2 Penn Plaza, New York, NY 10121. Copyright © 2015 by McGraw-Hill Education. All rights reserved. Printed in the United States of America. Previous editions © 2009 and 2003. No part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written consent of McGraw-Hill Education, including, but not limited to, in any network or other electronic storage or transmission, or broadcast for distance learning.

Some ancillaries, including electronic and print components, may not be available to customers outside the United States.

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 0 QTN/QTN 1 0 9 8 7 6 5 4

ISBN 978-0-07-802515-0  
MHID 0-07-802515-X

Senior Vice President, Products & Markets: *Kurt L. Strand*  
Vice President, General Manager, Products & Markets: *Michael Ryan*  
Vice President, Content Production & Technology Services: *Kimberly Meriwether David*  
Managing Director: *William R. Glass*  
Brand Manager: *Sarah Remington*  
Senior Director of Development: *Dawn Groundwater*  
Marketing Manager: *Kelly Odom*  
Director, Content Production: *Terri Schiesl*  
Content Project Manager: *Erin Melloy*  
Buyer: *Susan K. Culbertson*  
Designer: *Jana Singer*  
Cover Image: © *Comstock Images/Getty*  
Compositor: *MPS Limited*  
Typeface: *10/12 Times Roman*  
Printer: *Quad/Graphics*

All credits appearing on page or at the end of the book are considered to be an extension of the copyright page.

**Library of Congress Cataloging-in-Publication Data**

Benward, Bruce, author.  
Music in theory and practice / Bruce Benward, Marilyn Saker.—9th edition.  
volume cm  
Includes index.  
ISBN 978-0-07-802515-0 — ISBN 0-07-802515-X (hard copy)  
1. Music theory. I. Saker, Marilyn Nadine, author. II. Title.  
MT6.B34 M9 2014  
781—dc23

2013042060

The Internet addresses listed in the text were accurate at the time of publication. The inclusion of a website does not indicate an endorsement by the authors or McGraw-Hill Education, and McGraw-Hill Education does not guarantee the accuracy of the information presented at these sites.

---

# Contents

**Preface** ix

## **Introduction The Materials of Music: Sound and Time** xiii

Sound xiii  
    *Vibration* xiii  
    *Compression and Rarefaction* xiii  
    *Frequency* xiv  
The Four Properties of Sound xiv  
    *Pitch* xiv  
    *Intensity* xiv  
    *Duration* xiv  
    *Timbre* xv  
Summary xvi

---

## **PART A**

### **The Fundamentals of Music** 1

---

#### **CHAPTER 1**

##### **Notation** 3

Important Concepts 3  
    *Notation of Pitch* 3  
    *The Staff* 3  
    *Letter Names* 3  
    *The Clefs* 4  
    *Octave Identification* 6  
    *Accidentals* 7  
    *Interval* 7  
    *Enharmonic Equivalents* 8  
    *Half-Step Motion* 8  
    *Notation of Duration* 8  
    *The Tie* 9  
    *The Dot* 9  
    *Irregular Division of Notes* 10  
    *Rhythm* 10  
    *Meter Signatures* 10  
    *Dynamic Markings* 14  
    *History* 15  
Applications 16  
    *Some Directions for Notation* 16  
    *Practice* 20  
Assignments 21

---

#### **CHAPTER 2**

##### **Scales, Tonality, Key, Modes** 27

Important Concepts 27

*Scale* 27  
*Pitch Class* 27  
*Diatonic Scales* 28  
*Scale Degree Names* 28  
*Major Scale* 29  
*Tetrachord* 29  
*Transposition* 30  
*Key Signature* 30  
*Minor Scale* 32  
*Scale Relationships* 35  
*Tonality* 39  
*Key* 40  
*Other Scales* 40  
*History* 44  
Applications 46  
    *Pitch Inventory* 47  
    *Summary* 47  
    *Practice* 48  
Assignments 49

---

#### **CHAPTER 3**

##### **Intervals and Transposition** 55

Important Concepts 55  
    *Intervals* 55  
    *Perfect, Major, and Minor Intervals* 56  
    *Consonance and Dissonance* 58  
    *Augmented and Diminished Intervals* 58  
    *Enharmonic Intervals* 59  
    *Inversion of Intervals* 59  
    *Compound Intervals and Simple Intervals* 61  
    *History* 61  
Applications 62  
    *Fluency with Intervals* 62  
    *Melodic and Harmonic Intervals* 63  
    *Transposition* 64  
    *Methods of Transposition* 64  
    *Practice* 66  
Assignments 67

---

#### **CHAPTER 4**

##### **Chords** 73

Important Concepts 73  
    *Harmony* 73  
    *Chord* 73  
    *Triad* 73  
    *Triad Root* 73  
    *Major Triad* 74  
    *Minor Triad* 74  
    *Diminished Triad* 74  
    *Augmented Triad* 74

- Triad Stability* 75
- Triad Names* 75
- Primary Triads* 75
- Triad Position* 75
- Root Position* 75
- Triad Inversion* 76
- First Inversion* 76
- Second Inversion* 76
- Other Tertian Chords* 77
- Seventh Chords* 77
- History* 77
- Applications 77
  - Roman Numeral Analysis* 78
  - Triad Position Symbols* 79
  - Seventh-Chord Position Symbols* 80
  - Figured Bass* 80
  - Figured-Bass Symbols* 81
  - Macro Analysis* 83
  - Popular-Music Symbols* 85
  - Summary* 86
  - Practice* 86
- Assignments 87

## PART B

### The Structural Elements of Music 95

#### CHAPTER 5

#### Cadences and Nonharmonic Tones 97

- Important Concepts 97
  - Phrase* 97
  - Harmonic Cadence* 97
  - Rhythmic Cadence* 99
  - History* 100
  - Nonharmonic Tones* 102
  - Unaccented Nonharmonic Tones* 103
  - Accented Nonharmonic Tones* 104
  - Accented versus Unaccented Nonharmonic Tones* 109
  - Nonharmonic Tones Involving More Than Three Pitches* 109
  - Summary of Nonharmonic Tones* 111
  - Practice* 111
- Assignments 113

#### CHAPTER 6

#### Melodic Organization 119

- Important Concepts 119
  - The Motive* 119
  - Sequence* 121
  - Phrase* 123
  - Period* 125
  - Modification of the Phrase* 129
  - Melodic Structure* 131
  - History* 133
  - Practice* 134
- Assignments 135

#### CHAPTER 7

#### Texture and Textural Reduction 145

- Important Concepts 145
  - Texture* 145
  - Texture Types* 147
  - History* 150
- Applications 151
  - Analysis of Texture* 151
  - Textural Reduction* 155
  - Practice* 156
- Assignments 157

#### CHAPTER 8

#### Species Counterpoint 163

- Important Concepts 163
  - Species Counterpoint* 163
  - The Cantus Firmus* 163
  - The Counterpoint* 163
  - First Species Counterpoint* 163
  - Second Species Counterpoint* 164
  - Third Species Counterpoint* 164
  - Fourth Species Counterpoint* 164
  - Fifth Species Counterpoint* 165
  - History* 165
- Applications 166
  - Modal Scales* 166
  - Melodic Characteristics* 167
  - Writing First Species Counterpoint* 168
  - Writing Second Species Counterpoint* 172
  - Writing Third Species Counterpoint* 175
  - Writing Fourth Species Counterpoint* 177
  - Writing Fifth Species Counterpoint* 179
  - Summary* 182
  - Practice* 182
- Assignments 183

#### CHAPTER 9

#### Voice Leading in Four-Part Chorale Writing 191

- Important Concepts 191
  - Four-Voice Texture* 191
  - History* 192
- Applications 192
  - Analysis of the Chorale Phrases* 194
  - Stylistic Practices* 194
  - Root-Position Triads* 194
  - Repeated Chords* 198
  - First-Inversion Triads* 198
  - Second-Inversion Triads* 200
  - Exceptions to Stylistic Practices* 202
  - Unstylistic Departures* 202
  - Voice Ranges* 203
  - Voice Spacing* 203
  - Summary* 204
  - Practice* 204
- Assignments 205

## CHAPTER 10

---

### Harmonic Progression and Harmonic Rhythm 213

- Important Concepts 213
  - Harmonic Progression* 213
  - The Relationship of Chords* 214
  - Chord Progressions* 214
  - Harmonic Rhythm* 219
  - History* 220
- Applications 222
  - How to Harmonize a Tonal Melody* 222
  - Practice* 224
- Assignments 225

## CHAPTER 11

---

### The Dominant Seventh Chord 235

- Important Concepts 235
  - Dominant Seventh Chord* 235
  - Macro Analysis Symbol* 237
  - History* 237
- Applications 239
  - Resolution of the Dominant Seventh Chord* 239
  - Circle Progression* 239
  - Noncircle Progressions with Resolution* 241
  - Nonresolution of Seventh Factor* 241
  - Stylistic Practices for Voice Leading in V<sup>7</sup> Chords* 242
  - Practice* 242
- Assignments 243

## CHAPTER 12

---

### The Leading-Tone Seventh Chords 255

- Important Concepts 255
  - Leading-Tone Seventh Chords* 255
  - Progressions from vii<sup>♯7</sup> and vii<sup>♭7</sup>* 256
  - Resolution of Tritone and Seventh Factors* 257
  - Macro Analysis Symbols* 258
  - History* 258
- Applications 261
  - Voice Leading and the vii<sup>♯7</sup> and vii<sup>♭7</sup>* 261
  - Some Pitfalls to Avoid* 261
  - Practice* 262
- Assignments 263

## CHAPTER 13

---

### Nondominant Seventh Chords 271

- Important Concepts 271
  - Nondominant Seventh Chords* 271
  - Roman Numeral Symbols* 271
  - Seventh Chords in Major and Minor Keys* 272
  - Macro Analysis Symbols* 273
  - History* 274
- Applications 276
  - Nondominant Seventh Chords in Circle Progressions* 276

- Resolution of the Seventh Factor* 276
- Noncircle Treatment* 277
- Voice Leading of Nondominant Seventh Chords* 278
- Practice* 278
- Assignments 279

## CHAPTER 14

---

### Secondary Dominant and Leading-Tone Chords 287

- Important Concepts 287
  - Secondary Dominants* 287
  - Secondary Leading-Tone Chords* 290
  - Macro Analysis* 293
  - History* 295
  - Summary* 301
  - Practice* 301
- Assignments 303

## CHAPTER 15

---

### Modulation 315

- Important Concepts 315
  - Modulation* 315
  - Closely Related Keys* 315
  - Common-Chord Modulation* 316
  - Chromatic Modulation* 316
  - Phrase Modulation* 317
  - Other Modulation Types* 317
  - Modulations in Period Construction* 318
  - Analytical Symbols for Modulations* 319
  - Macro Analysis* 320
  - History* 321
- Applications 321
  - Harmonizing Melodies That Modulate* 321
  - Practice* 324
- Assignments 325

## CHAPTER 16

---

### Two-Part (Binary) Form 339

- Important Concepts 339
  - Formal Divisions* 339
  - Open versus Closed Formal Divisions* 339
  - Simple versus Compound Forms* 339
  - Two-Part Form* 339
  - History* 346
  - Summary* 347
  - Practice* 347
- Assignments 349

## CHAPTER 17

---

### Three-Part (Ternary) Form 355

- Important Concepts 355
  - Three-Part Form* 355
  - Expanded Ternary Form* 360



<i>Rounded Binary Form</i>	360
<i>History</i>	362
<i>Summary</i>	364
<i>Practice</i>	364
Assignments	365

## Appendixes

A. Summary of Part-Writing Practices	373
B. Macro Analysis Symbols	375
C. Popular Music Chord Symbols	377
D. Expression Marks	379
E. Instrument Ranges, Transpositions, and Foreign Names	381
F. History	385

Glossary	389
----------	-----

Credits	395
---------	-----

## Indexes

Musical Example Index	397
Subject Index	401

---

# 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 musical 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:

<b>Analysis Skills</b>	The ability to discern the design, proportions, and patterns of music.
<b>Historical Perspective</b>	An understanding of the rich heritage of the past and the styles of music that evolved during the different periods of musical writing.
<b>Compositional Skills</b>	Insight into the ways in which music is put together and into the forms, elements, and resolutions required of the composer.
<b>A “Seeing” Ear</b>	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 <i>Ear Training: A Technique for Listening</i> by Bruce Benward and J. Timothy Kolosick.
<b>A “Hearing” Eye</b>	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 <i>Sight Singing Complete</i> by Maureen Carr and Bruce Benward.
<b>Performance</b>	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 ninth edition of *Music in Theory and Practice* includes the following changes:

1. The placement of musical examples has been revised to eliminate as many awkward page turns and cross-references as possible.
2. The chapter on voice leading in chorale writing has been amended to include musical examples that demonstrate stylistic practices within the context of an entire phrase.
3. A series of pedagogical “practice” instructions have been added to guide students through their initial efforts understanding concepts.
4. Several new full-length compositions have been added to allow students additional opportunity to study complete works rather than isolated sections of a composition.

---

### Texts and Supplements

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

Online Learning Center at [www.mhhe.com/mtp9](http://www.mhhe.com/mtp9)

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

Online Learning Center at [www.mhhe.com/mtp9](http://www.mhhe.com/mtp9)

Resources available from the Online Learning Center include printable versions of the Instructor’s Manuals and Workbook Solutions Manuals, assignment templates compatible with Finale® music notation software, supplementary drill assignments, testing materials, and recordings. Audio Examples posted online for this edition of *Music in Theory and Practice* are identified throughout the texts and workbooks with the following graphic: .

## Acknowledgments

It is with deep appreciation and sincere gratitude that I thank Chris Freitag for his numerous important contributions to *Music in Theory and Practice*. His many years of work on behalf of the text, along with his always wise and patient counsel, made a significant impact that will never be forgotten.

Grateful acknowledgment is extended to Mark Pappas of Eastern Michigan University for his insightful recommendations for the jazz and popular-music examples appearing throughout the two volumes.

The exemplary work of the McGraw-Hill professional staff deserves both recognition and commendation. The efforts of Sarah Remington, Erin Melloy, Barbara Hacha, Jana Singer, Kay Munson, Yu Vongkiatkajorn, Laura Wilk, Craig Leonard, Dawn Groundwater, and the entire production team are genuinely valued and appreciated.

Grateful acknowledgment is extended to the following individuals, whose suggestions, comments, and reviews were extremely helpful:

Bill Carmody, *Sierra College*  
James Chenevert, *Texas Woman's University*  
Robin Connell, *Grand Rapids Community College*  
Jason Howard, *Westminster College*  
Jack D. Jenny, *Otterbein University*  
Denise Root Pierce, *Eastern Michigan University*  
Lauren Shackelford, *The Master's College*

I would be remiss not to acknowledge the life's work of my brilliant mentor and kind-hearted coauthor, Bruce Benward. Simply put, without Bruce Benward, there would be no *Music in Theory and Practice*. His creative genius and enduring vision continues to be a motivating force behind the text, and his timeless perspective remains part of the ninth edition. Dr. Benward's significant contributions are respectfully acknowledged, along with the promise that *Music in Theory and Practice* will forever be "The Benward."

*Marilyn Saker*

# INTRODUCTION

## The Materials of Music: Sound and Time

### Topics

Sound  
Vibration  
Compression  
Rarefaction  
Frequency  
Pitch

Tone  
Intensity  
Acoustics  
Decibels  
Duration  
Meter

Beat  
Rhythm  
Timbre  
Harmonic Series  
Partials  
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

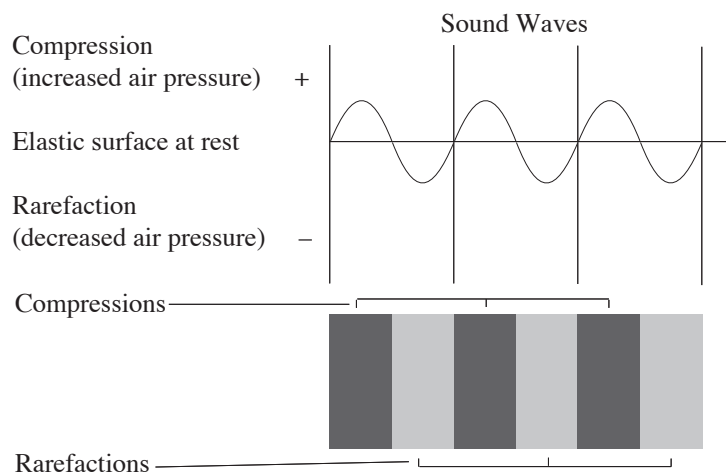
*Sound* is the sensation perceived by the organs of hearing when vibrations (sound waves) reach the ear.

### 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

### Pitch

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* 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, and 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	<i>pp</i>	Very soft	40
Piano	<i>p</i>	Soft	50
Mezzo piano	<i>mp</i>	Moderately soft	60
Mezzo forte	<i>mf</i>	Moderately loud	70
Forte	<i>f</i>	Loud	80
Fortissimo	<i>ff</i>	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:

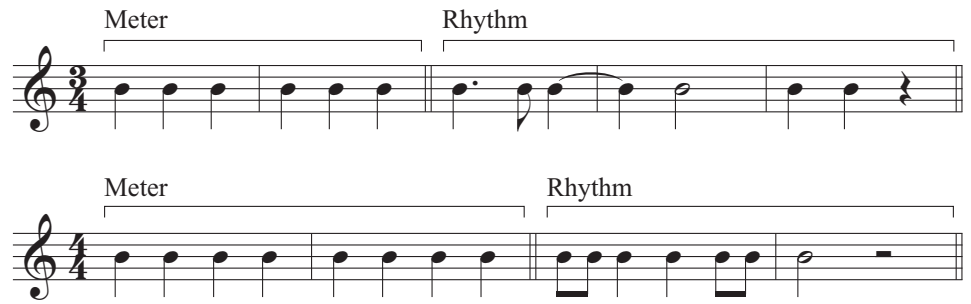
Duple meter: > – | > – | > – | = 

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.



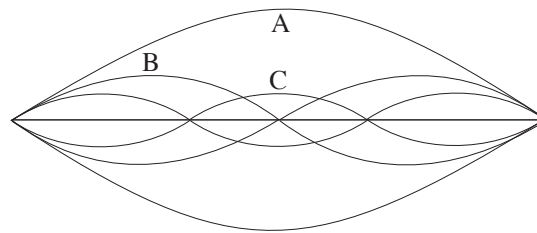
## Timbre

*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:

Partial	Frequency (in Hz.)
1	55
2	110
3	165
4	220
5	275
6	330
7	385
8	440
9	495
10	550
11	605
12	660
13	715
14	770
15	825
16	880



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.

## PART A

# The Fundamentals of Music

**B**efore 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.

*This page intentionally left blank*

# CHAPTER 1

## Notation

### Topics

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

### 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

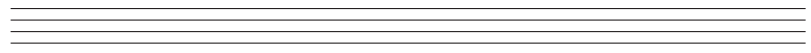
The term *pitch* describes the highness or lowness (the frequency) of a tone. In music notation, pitches are represented by symbols positioned on a staff and identified with letter names.

### 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



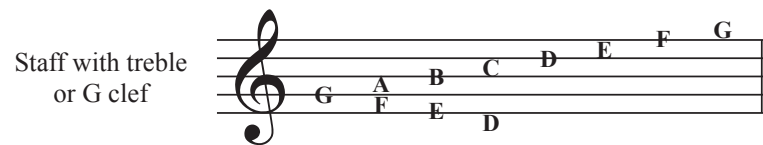
## The Clefs

### Treble Clef (G)

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.

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



### 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.

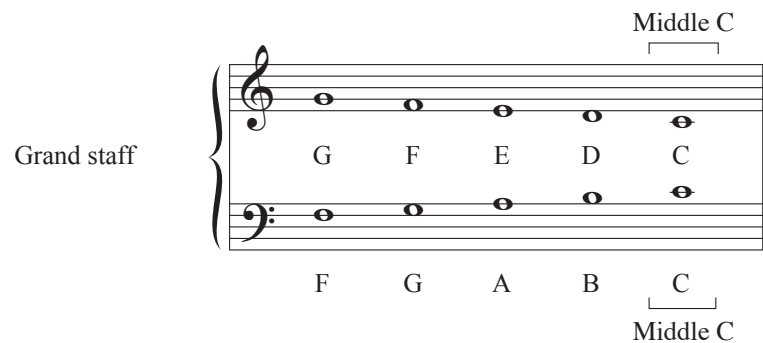
Figure 1.4



### Grand Staff

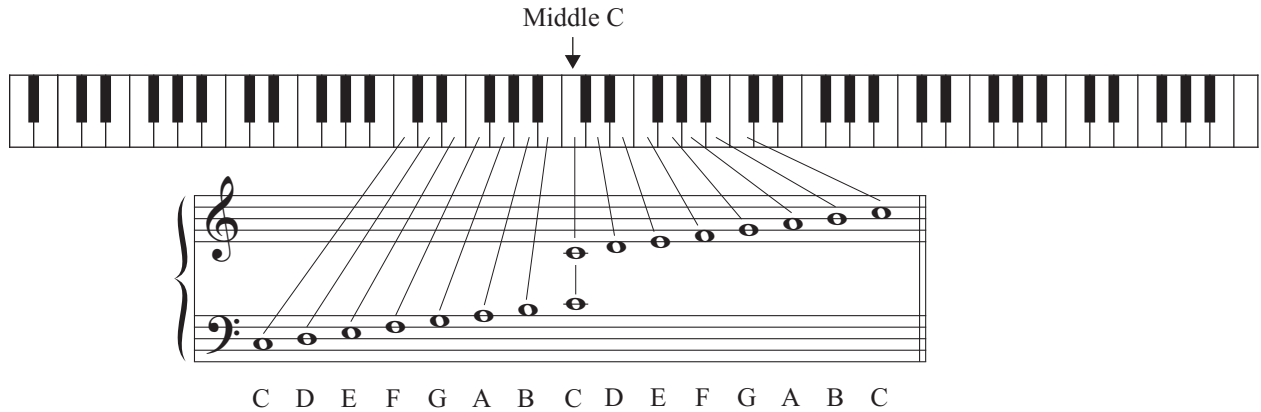
Together, the treble and bass staves make up a *grand staff*. Figure 1.5 shows the point at which both clefs converge. The two Cs are the same pitch: *middle C*.

Figure 1.5



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.

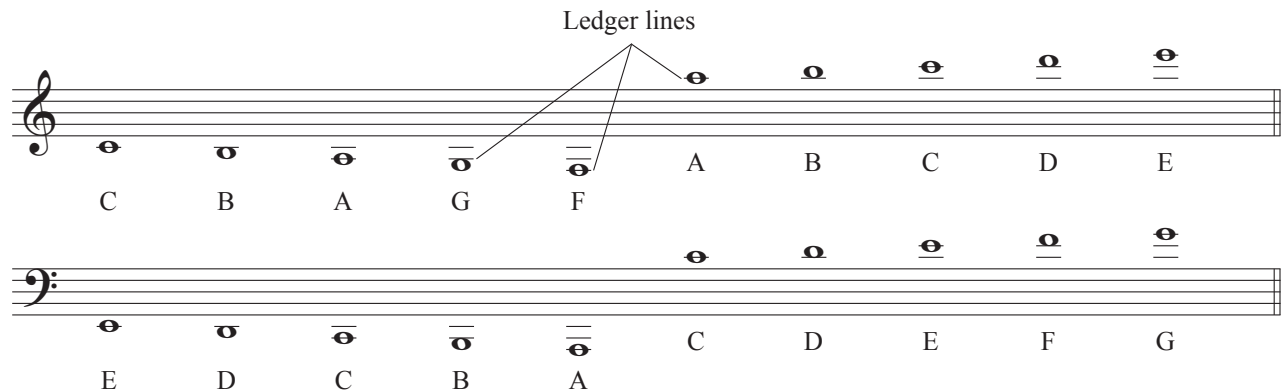
Figure 1.6



**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).

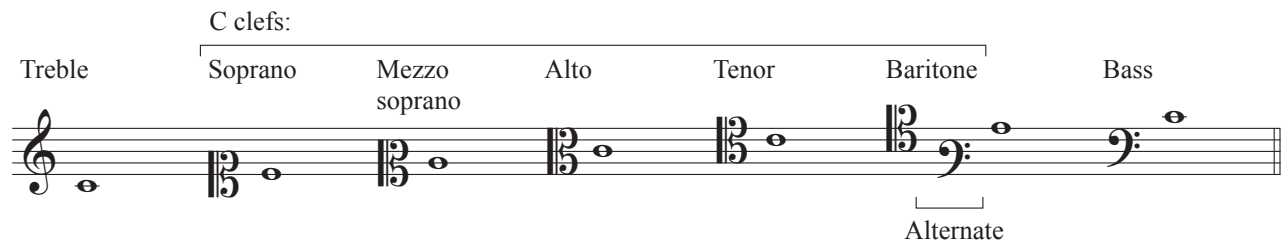
Figure 1.7



**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

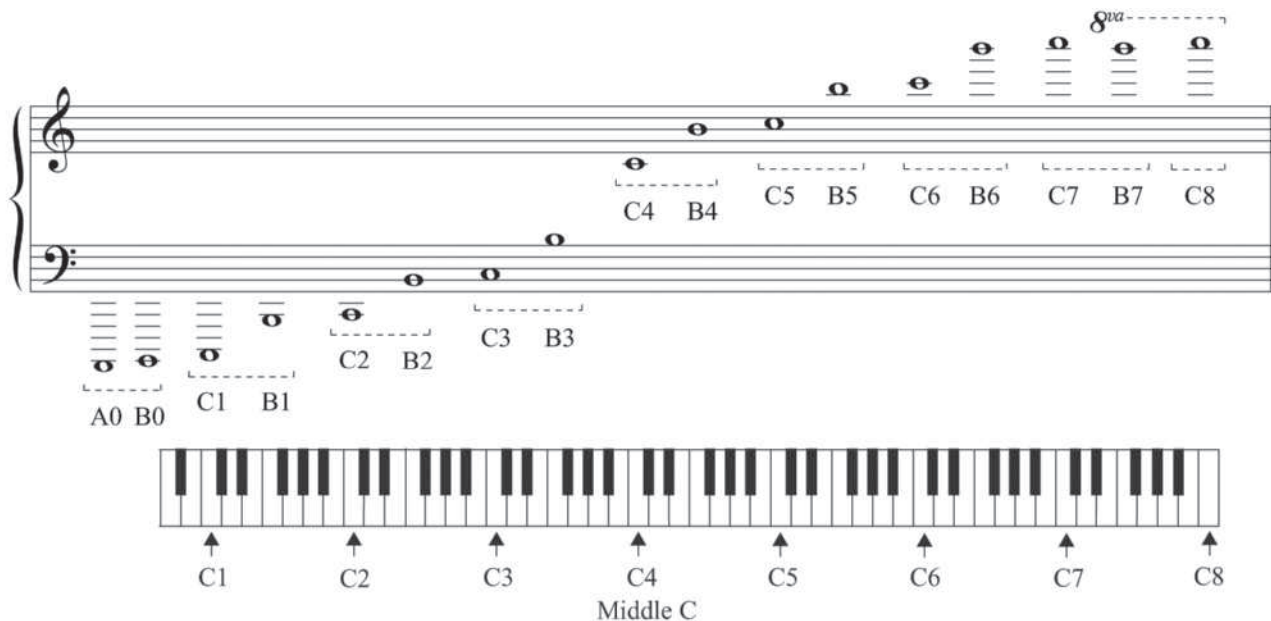
The *soprano*, *mezzo soprano*, and *baritone clefs* are C clefs used less often than the alto and tenor clefs. In each case the line indicated by the notch of the clef is designated as middle C.

## 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).

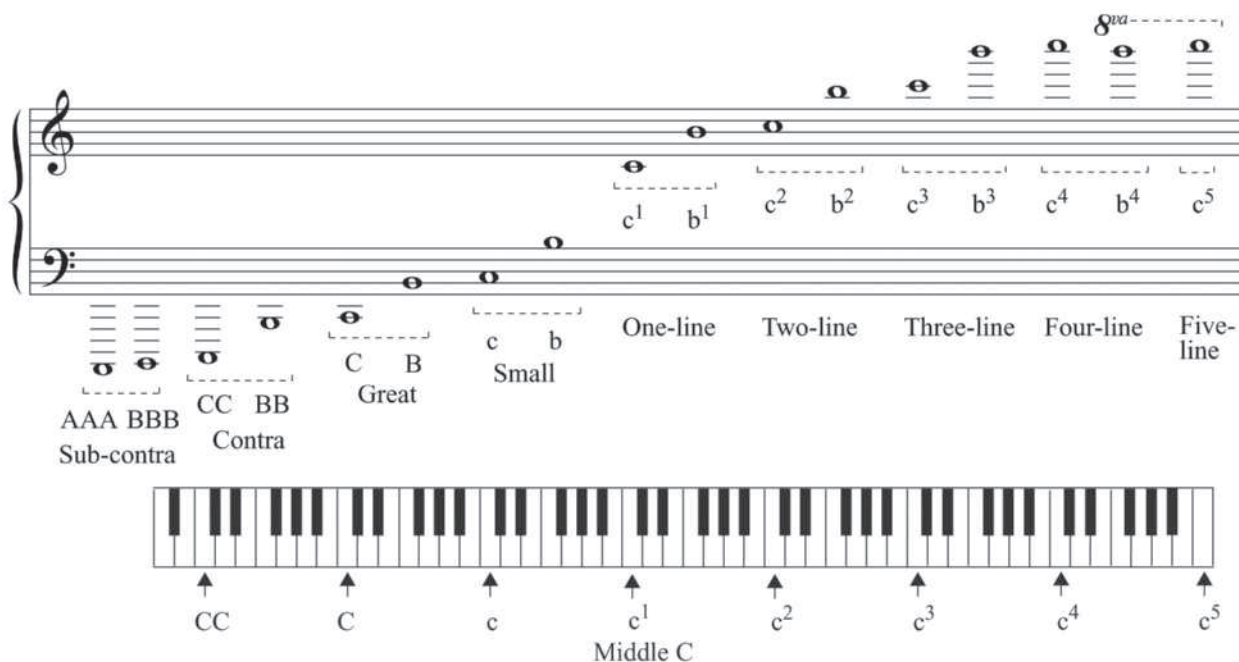
The system of octave identification in Figure 1.9 is recommended by the International Acoustical Society and is used in Braille music notation. Each octave of this system is numbered, beginning with A0 for the lowest note on the piano and extending to C8 for the highest note on the piano. Although the 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  $\delta va$  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,  $\delta va$  *bassa* (the  $\delta va$  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  $\delta vb$  as a shorthand symbol to represent  $\delta va$  *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* (b)—lowers the pitch a half step.

*Natural* (♮)—cancels any previous sharp or flat and returns to the natural, or unaltered, pitch.

*Double Sharp* (x)—raises the pitch two half steps.

*Double Flat* (bb)—lowers the pitch two half steps.

Figure 1.11

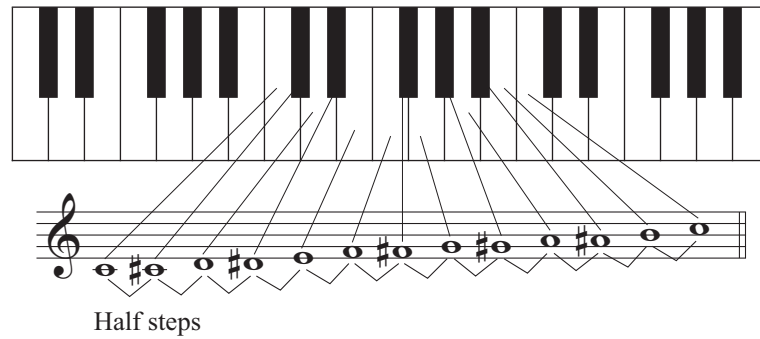


## Interval

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.



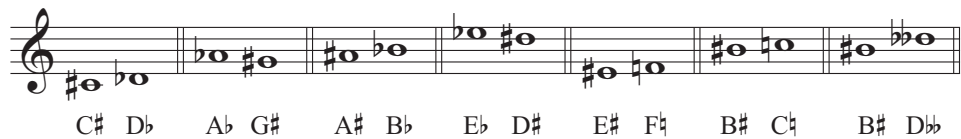
Figure 1.12



## Enharmonic Equivalents

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

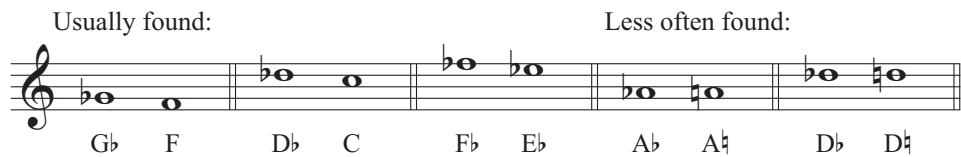
Figure 1.13



## 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:

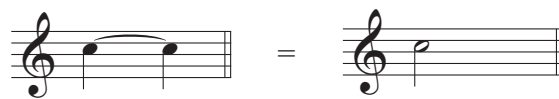
Figure 1.16

Name	Note	Rest	Equivalents	
Breve (double whole note)	⏏ or ⏏		Two whole notes	
Whole note	⦿		Two half notes	
Half note			Two quarter notes	
Quarter note			Two eighth notes	
Eighth note			Two sixteenth notes	
Sixteenth note			Two thirty-second notes	
Thirty-second note			Two sixty-fourth notes	
Sixty-fourth note			Two one hundred twenty-eighth notes	

## 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.

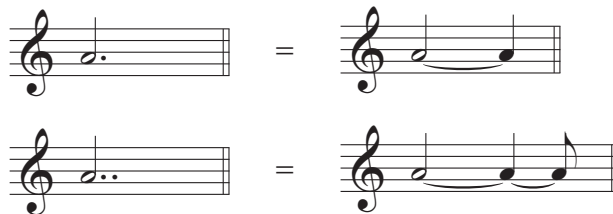
Figure 1.17



## The Dot

Placed to the right of a note head, 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.