SCALES AND KEY SIGNATURES

Subcourse Number MU 1300

EDITION A

US Army Element, School of Music
1420 Gator Boulevard, Norfolk, VA 23521-5170
12 Credit Hours
Edition Date: June 1998

SUBCOURSE OVERVIEW

This subcourse is designed to teach you to identify and write scales and key signatures.
There are no prerequisites for this subcourse.
Unless otherwise stated, the masculine gender of singular pronouns is used to refer to both men and women.

TERMINAL LEARNING OBJECTIVE

ACTION: You will identify and write major, minor, whole tone, pentatonic, chromatic and modal scales and key signatures.

CONDITION: Given the information in this lesson.

STANDARD: To demonstrate competency of this subcourse, you must achieve a minimum of 70% on the subcourse examination.
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Answer Key and Feedback

Examination

Student Inquiry Sheets

ADMINISTRATIVE INSTRUCTIONS

1. There are five lessons in this subcourse.

2. Materials needed in addition to this booklet are a number 2 pencil and the ACCP examination response sheet and preaddressed envelope you received with this subcourse.

3. Supervisory requirements: None.

GRADING AND CERTIFICATION INSTRUCTIONS

Examination: This subcourse contains a multiple-choice examination covering the material in the five lessons. After studying the lessons and working through the practice exercises, complete the examination. Mark your answers in the subcourse booklet, then transfer them to the ACCP examination response sheet. Completely black out the lettered oval which corresponds to your selection (A, B, C, or D). Use a number 2 lead pencil to mark your responses. When you complete the ACCP examination response sheet, mail it in the preaddressed envelope you received with this subcourse. You will receive an examination score in the mail. You will receive 12 credit hours for successful completion of this examination.
LESSON 1
TETRACHORDS AND SCALES

OVERVIEW

LESSON DESCRIPTION:
In this lesson, you will learn to identify and write tetrachords.

TERMINAL LEARNING OBJECTIVE:
ACTION: You will identify and write tetrachords.
CONDITION: Given the material in this lesson.
STANDARD: IAW the information given in this lesson.
REFERENCES: The material in this lesson was derived from Training Circular 12-41 and 12-42.

INTRODUCTION

A tetrachord is a graduated series of musical tones ascending or descending in order of pitch according to a specified interval scheme. An interval is the difference in pitch between tones. Music depends on the succession of pitches and certain measurable patterns of intervals used with regularity. These patterns may be extracted from musical examples, arranged in order, and expressed as scales.

The basic intervals used for scale analysis are the half step (semitone) and whole step (whole tone). Any two adjacent keys on the keyboard sound a half step. The interval of two half steps sounds a whole step. A whole step (two half steps) occurs between C and D, D and E, F and G, G and A, and A and B. Observe that there are no keys between E and F, and B and C; these intervals are half steps (Figure 1-1).

![Figure 1-1: Whole Steps and Half Steps.](image)

PART A TETRACHORDS

1. Tetrachord Structure
A tetrachord is a series of four tones on successive degrees of the staff with an interval of five half steps between the first and last tones. The tetrachord is used in constructing and analyzing.

Tetrachords used are the major (M), minor (m), natural (N), and harmonic (H). Any tetrachord may be constructed on any pitch and will retain the interval relationship of the tetrachord.

2. **Major Tetrachord (M)** The major tetrachord is composed of two half steps, two half steps and one half step ascending on four successive staff degrees (Figure 1-2).

![Figure 1-2: Major Tetrachords.](image)

3. **Minor Tetrachord (m)** The minor tetrachord is composed of two half steps, one half step and two half steps ascending on four successive scale degrees (Figure 1-3).

![Figure 1-3: Minor Tetrachords.](image)

4. **Natural Tetrachord (N)** The natural tetrachord is composed of one half step, two half steps and two half steps ascending on four successive staff degrees (Figure 1-4).
5. Harmonic Tetrachord (H) The harmonic tetrachord is composed of one half step, three half steps, and one half step ascending on four successive staff degrees (Figure 1-5).

6. Scale construction using Tetrachords

   a. Scales constructed with tetrachords combine two tetrachords and a link (abbreviated L). The link is always composed of two half steps (a whole step) on adjacent staff degrees. The link may be placed at the beginning, in the middle, or at the end of the scale. The combination of two tetrachords and a link form a scale that encompasses an octave (Figure 1-6).
b. The combination of two tetrachords and a link form a scale that encompasses an octave. An octave is an interval containing twelve half steps. It is the distance from one pitch to the next higher or lower pitch with the same letter name C-C (Figure 1-7).
LESSON 1
PRACTICE EXERCISE

The following items will test your understanding of the material covered in this lesson. There is only one correct answer for each item. When you have completed the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, review that part of the lesson which contains the portion involved.

1. The first and last tones of a tetrachord have what interval between them?
   A. four half steps
   B. four whole steps
   C. five half steps
   D. five whole steps

2. The minor tetrachord (m) contains which of the following?
   A. one half step, two half steps, and two half steps
   B. one half step, three half steps, and one half step
   C. two half steps, one half step, and two half steps
   D. two half steps, one half step, and one half step

3. The major tetrachord (M) contains which of the following?
   A. one half step, two half steps, and two half steps
   B. one half step, three half steps, and one half step
   C. two half steps, one half step, and one half step
   D. two half steps, two half steps, and one half step

4. The natural tetrachord (N) contains which of the following?
   A. one half step, two half steps, and two half steps
   B. one half step, three half steps, and one half step
   C. one half step, two half steps, and two whole steps
   D. one half step, two half steps, and one half step

5. The harmonic tetrachord (H) contains which of the following?
   A. one half step, three half steps, and two half steps
   B. one half step, three half steps, and one half step
   C. one half step, two half steps, and two half steps
D. three half steps, one half step, and one half step

LESSON 1

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

<table>
<thead>
<tr>
<th>Item</th>
<th>Correct Answer and Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>C. five half steps (paragraph 1a)</td>
</tr>
<tr>
<td>2.</td>
<td>C. two half steps, one half step, and two half steps (paragraph 3)</td>
</tr>
<tr>
<td>3.</td>
<td>D. two half steps, two half steps, and one half step (paragraph 2)</td>
</tr>
<tr>
<td>4.</td>
<td>A. one half step, two half steps, and two half steps (paragraph 4)</td>
</tr>
<tr>
<td>5.</td>
<td>B. one half step, three half steps, and one half step (paragraph 5)</td>
</tr>
</tbody>
</table>
LESSON 2
MAJOR SCALES AND KEY SIGNATURES

OVERVIEW

LESSON DESCRIPTION:
In this lesson, you will learn to identify and write major scales, key signatures and scale degrees.

TERMINAL LEARNING OBJECTIVE:
ACTION: You will identify and write major scales, key signatures and scale degrees.
CONDITION: Given the material in this lesson.
STANDARD: IAW the information given in this lesson.
REFERENCES: The material contained in this lesson was derived from Training Circular 12-41 and 12-42.

INTRODUCTION

Major scales are designated by half steps between the third & fourth and seventh & eighth degrees.
Key signatures are the group of sharps or flats placed to the right of the clef on a staff to identify the key.

PART A MAJOR SCALES

1. Major Scale Structure.
   a. The formula for a major scale is Major (M), Link (L), Major (M)

   ![Figure 2-1: Major Scale Formula.](image)

   
   Scale Degrees (Ascending)  
   1 2 3 4 5 6 7 8 
   Scale Degrees (Descending)  
   2 2 1 2 2 2 1

   NOTE: Upper and lower case letters are used to differentiate between major and minor keys. Upper case letters represent major keys (C Major). Lower case letters represent minor keys (c minor).

   ![Figure 2-2: C Major Scale on Keyboard.](image)
2. Use of Chromatic Signs in Major Scale Construction. To construct a scale other than C Major, chromatic signs ( flat or sharp) must be used to maintain the scale formula (whole step/half step). The D Major scale is written with chromatic signs on the third and seventh notes (Figure 2-3).

Figure 2-3: D Major Scale.

a. The first note of a major scale gives the scale its identity or name. For example, a major scale beginning on the note E flat is called an "E flat Major scale" (Figure 2-4).

![Figure 2-4: E Flat Major Scale.](image)

b. Musical compositions are based on scales. A composition based on an E flat Major scale is said to be in the key of E flat Major (Figure 2-5).

![Figure 2-5: Melody in E Flat.](image)

**SELF REVIEW EXERCISE #1**

Exercise #1. Constructing major scales. The first note is indicated in each exercise. The first exercise is completed for you.

**PART B – SCALES AND KEY SIGNATURES CONTINUED**

4. Key Signatures.
a. A key signature is the grouping of chromatic signs that have been extracted from a scale and placed after the clef sign. The number of flats or sharps in a key signature determines the key of a composition.

b. The E flat Major scale has a key signature of three flats (Figure 2-6).

![Figure 2-6: Extracting Accidentals for Key Signatures.](image)

c. The E flat Major scale with the key signature in place, looks like this (Figure 2-7).

![Figure 2-7: E Flat Major Key Signature.](image)

5. Placement of Sharps in a Key Signature.

a. Sharps are placed on the staff in the following order (Figure 2-8).

```
F# - C# - G# - D# - A# - E# - B#
```

![Figure 2-8: Order of Sharps.](image)

b. To determine this order, begin on F sharp (the first sharp added to the staff). Count up five letter names to C sharp. Then begin on C sharp and count up five more letter names to G sharp. Continue this pattern until all seven sharps are identified (Figure 2-9).

```
F#-g-a-b-C#-d-e-f-G#-a-b-c-D#-e-f-g-A#-b-c-d-E#-f-g-a-B#
```

![Figure 2-9: Determining Order of Sharps.](image)

c. Sharps are placed on a staff in a specific pattern. The first sharp, F sharp, is placed on the fifth line of the treble staff and the fourth line of the bass staff. The second sharp, C sharp, is placed below the first sharp. The third sharp is up, the fourth sharp down, the fifth sharp down, the sixth sharp up, and the seventh sharp down. Figure 2-10 indicates the correct placement of sharps in a key signature.

![Figure 2-10: Placement of Sharps.](image)
6. Placement of Flats in a Key Signature.

a. Flats are placed on the staff in the following order (Figure 2-11).

b. To determine the order of flats, begin on B flat (the first flat added to the staff). Count up four letter names to E flat. Then begin on E flat and count up four more letter names to A flat. Continue this pattern until all seven flats have been identified (Figure 2-12).

c. The first flat, B flat, is placed on the third line of the treble staff and on the second line of the bass staff. The second flat, E flat, is placed above the first flat. The third flat is down, the fourth up, the fifth down, the sixth up, and the seventh down (Figure 2-13).

NOTE: The order of flats in a key signature is opposite the order of sharps (Figure 2-14).
7. **Circle of Major Keys.** Major keys are arranged in a circle starting with C and progressing through the sharp keys clockwise and the flat keys counterclockwise. This forms the circle of major keys, also called the circle of fifths (Figure 2-15).

![Figure 2-15: Circle of Major Keys (Fifths).](image)

8. **Deriving Major Key Names from Key Signatures.**
   a. **Sharp keys.** The name of the sharp major key is the same as the letter name of the scale degree above the last sharp in the key signature (Figure 2-16).

![Figure 2-16: Determining Sharp Key Names.](image)

b. **Flat keys.** The name of the flat major key is the same as the letter name of the scale degree five steps above the last flat in the key signature (Figure 2-17).

![Figure 2-17: Determining Flat Key Names.](image)

c. **When there are two or more flats in the key signature,** the key name is the name of the next to the last flat (Figure 2-18).
d. If the key signature has no flats or sharps, the key signature name is C Major.

**SELF REVIEW EXERCISE #s 2, 3 & 4**

Exercise #2. Write the sharps or flats in the order they would appear in a piece of music. The first exercise is completed for you.

1. 2 sharps   F sharp, C sharp
2. 7 sharps
3. 4 flats
4. 6 flats
5. 3 flats
6. 4 sharps
7. 5 sharps
8. 5 flats
9. 1 sharps
10. 1 flat
11. 7 flats
12. 6 sharp
13. 3 sharps
14. 2 flats
Exercise #3. In each blank space, write the correct number of sharps or flats and the key signature for the major key on the staff provided. The first exercise is completed for you.

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Key</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>B♭</td>
<td>B♭</td>
</tr>
<tr>
<td>2.</td>
<td>G♭</td>
<td>G♭</td>
</tr>
<tr>
<td>3.</td>
<td>D♭</td>
<td>D♭</td>
</tr>
<tr>
<td>4.</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>5.</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>6.</td>
<td>F♯</td>
<td>F♯</td>
</tr>
<tr>
<td>7.</td>
<td>G</td>
<td>G</td>
</tr>
<tr>
<td>8.</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>9.</td>
<td>C♯</td>
<td>C♯</td>
</tr>
<tr>
<td>10.</td>
<td>C♭</td>
<td>C♭</td>
</tr>
<tr>
<td>11.</td>
<td>E♭</td>
<td>E♭</td>
</tr>
<tr>
<td>12.</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>13.</td>
<td>D</td>
<td>D</td>
</tr>
<tr>
<td>14.</td>
<td>A♭</td>
<td>A♭</td>
</tr>
</tbody>
</table>

Exercise #4. Write the name of the major key for each key signature below the staff. Also, write the first note of the major scale named by the key on the staff. The first exercise is completed for you.

PART C--SCALE DEGREE

9. Scale Degree Names for Major Scales. "Scale tone," "scale step," and "scale degree" all mean the same thing. Each scale tone, step, or degree is also known by a more formal musical term (Figure 2-19).

Figure 2-19: Names of Scale Degrees.

a. Tonic. The tonic is the beginning scale degree (the first scale step) of a scale. It is the most important scale degree. The tonic gives the scale its identity. In a C Major scale, C is the tonic scale degree (Figure 2-20).
b. Dominant. The next most important scale degree is the dominant. The dominant is the fifth scale degree. In a C Major scale, G is the dominant scale degree (Figure 2-21).

c. Subdominant. The scale degree five steps (fifth) below the tonic is the subdominant. It is the fourth scale degree. The subdominant scale degree is the dominant under (sub) the tonic. It is next in importance to the dominant. In a C Major scale, the subdominant is F (Figure 2-22).

d. Mediant. Midway between the tonic and the dominant is the third scale degree. It is called the mediant. In a C Major scale, E is the mediant scale degree (Figure 2-23).

e. Submediant. The sixth scale degree, midway between the upper tonic and the subdominant, is the submediant. In a C Major scale, A is the submediant scale degree (Figure 2-24).

f. Supertonic. The tone above (super) the tonic, or the second scale degree, is called the supertonic. In a C Major scale, D is the supertonic scale degree (Figure 2-25).
g. Leading tone. The seventh scale degree is the leading tone. It has a strong tendency to push upward (lead) to the tonic. In a C Major scale, B is the leading tone (Figure 2-26).

**SELF REVIEW EXERCISE #5**

Exercise #5. Identifying Scale Degree Activity. Write the name of the scale degree below each note on the staff. The first note on each staff is the tonic. The first exercise is completed for you.
PART D  SCALE DEGREE ACTIVITY

10. Scale Degree Activity in Major Keys. Scale degrees are classified into three types of tones: stable, active, and tendency (Figure 2-27).

<table>
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<tr>
<th>Stable</th>
<th>Active</th>
<th>Tendency Tones</th>
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<tbody>
<tr>
<td>Tonic</td>
<td>Supertonic</td>
<td>Subdominant</td>
</tr>
<tr>
<td>Mediant</td>
<td>Subdominant</td>
<td>Leading Tone</td>
</tr>
<tr>
<td>Dominant</td>
<td>Submediant</td>
<td>Leading Tone</td>
</tr>
</tbody>
</table>

**Figure 2-27:** Scale Degree Activity in Major Keys.

a. Stable tones have a sound quality that suggests completeness and stability (Figure 2-28).

**Figure 2-28:** Stable Tones in Major Keys.

b. Active tones lack stability and want to move toward a stable tone. Normally, an active tone moves to an adjacent note in the scale (Figure 2-29).

**Figure 2-29:** Active Tones in Major Keys.

c. Tendency tones are active tones that pull toward a particular pitch. Tendency tones tend to move a half step to an adjacent scale degree. A leading tone moves to the tonic unless it is part of a descending scalewise motion. The subdominant moves to the mediant unless it is part of scalewise motion that is ascending (Figure 2-30).

**Figure 2-30:** Tendency Tones in Major Keys.
SELF REVIEW EXERCISE #6

Exercise #6. Scale Degree Activity. Use the key signatures and notes on the staffs below to write the name of the key, name of the scale degree, and the activity of the scale degree. The first exercise is completed for you.

1. A♭, submediant, active

2.  

3.  

4.  

5.  

6.  

7.  

8.  

Subdominant    Leading Tone
ANSWERS TO SELF REVIEW EXERCISES
EXERCISE #1

1. 2 sharps, F sharp, C sharp
2. 7 sharps- F sharp, C sharp, G sharp, D sharp, A sharp, E sharp, B sharp
3. 4 flats-B flat, E flat, A flat, D flat
4. 6 flats-B flat, E flat, A flat, D flat, G flat, C flat
5. 3 flats- B flat, E flat, A flat
6. 4 sharps- F sharp, C sharp, G sharp, D sharp
7. 5 sharps- F sharp, C sharp, G sharp, D sharp, A sharp
8. 5 flats- B flat, E flat, A flat, D flat, G flat
9. 1 sharp- F sharp
10. 1 flat B flat

EXERCISE #2

1. 2 sharps, F sharp, C sharp
2. 7 sharps- F sharp, C sharp, G sharp, D sharp, A sharp, E sharp, B sharp
3. 4 flats-B flat, E flat, A flat, D flat
4. 6 flats-B flat, E flat, A flat, D flat, G flat, C flat
5. 3 flats- B flat, E flat, A flat
6. 4 sharps- F sharp, C sharp, G sharp, D sharp
7. 5 sharps- F sharp, C sharp, G sharp, D sharp, A sharp
8. 5 flats- B flat, E flat, A flat, D flat, G flat
9. 1 sharp- F sharp
10. 1 flat B flat
11. 7 flats- B flat, E flat, A flat, D flat, G flat, C flat, F flat
12. 6 sharps- F sharp, C sharp, G sharp, D sharp, A sharp, E sharp
13. 3 sharps- F sharp, C sharp, G sharp
14. 2 flats- B flat, E flat

EXERCISE #3

EXERCISE #4

EXERCISE #5
EXERCISE #6

1. A♭, submediant, active
3. D, mediant, stable
5. F, dominant, stable
7. B, subdominant, active/tendency

2. B♭, tonic, stable
4. D♭, leading tone, active/tendency
6. A, dominant, stable
8. E♭, supertonic, active
LESSON 2
PRACTICE EXERCISE

The following items will test your understanding of the material covered in this lesson. There is only one correct answer for each item. When you have completed the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, review that part of the lesson which contains the portion involved.

1. The formula for a Major scale is?
   
   A.  M M L
   B.  L M M
   C.  M L M
   D.  M M M

2. Beginning on any note other than C, what must be used to construct a major scale?
   
   A.  white keys
   B.  the bass clef
   C.  the treble clef
   D.  chromatic signs

![Figure 1: Questions 3 and 4.](image)

3. This scale is what pattern of half steps? (Refer to figure 1.)
   
   A.  1 2 2 1 2 2
   B.  1 2 1 2 2 1
   C.  1 2 2 1 2 2
   D.  1 2 1 2 1 2

4. The key signature in Figure 1 would have how many sharps?
   
   A.  two
   B.  three
   C.  four
5. The name of the sharp major key is the same as the letter name of the scale degree found where?
   A. one step below the last sharp
   B. one step above the last sharp
   C. one half step above the last sharp in the key signature
   D. one half step below the last sharp in the key signature

6. What is the basis for musical compositions?
   A. scales
   B. tonics
   C. semitones
   D. whole tones

7. What is the order of sharps in a key signature?
   A. F sharp G sharp C sharp D sharp A sharp E sharp B sharp
   B. F sharp C sharp G sharp A sharp E sharp B sharp D sharp
   C. F sharp C sharp G sharp D sharp E sharp A sharp B sharp
   D. F sharp C sharp G sharp D sharp A sharp E sharp B sharp

8. Which statement is correct concerning the order of sharps and the order of flats in a key signature?
   A. they are in the same order
   B. they are opposite of each other
   C. there is no relationship
   D. the first 3 sharps are the same as the last 3 flats

9. What is another word for scale degree?
   A. song
   B. note
   C. scale tone
   D. whole tone

10. What scale degree is next in importance to the dominant scale degree?
    A. mediant
B. submediant
C. supertonic
D. subdominant

11. What is the leading tone of a Gb Major scale?
   A. F flat
   B. F Double flat
   C. F
   D. F sharp

12. What major key has six sharps?
   A. A
   B. B
   C. E
   D. F sharp

13. What is the subdominant scale degree of an A flat Major scale?
   A. D flat
   B. E flat
   C. F
   D. C

14. What are the tendency tones in a G Major scale?
   A. D and F sharp
   B. C and E
   C. D and A
   D. C and F sharp

15. What are the stable tones in a D flat Major scale?
   A. D flat, F, A flat
   B. E flat, G flat, B flat
   C. F, A flat, C
   D. G flat, B flat, D flat
16. The subdominant in A Major is pulling toward what note?
   A. E
   B. C sharp
   C. A
   D. G sharp

17. What note is NOT found in the D Major scale?
   A. A
   B. C sharp
   C. F
   D. B

18. What are the active tones in an F Major scale?
   A. G, B flat, D, and E
   B. A, D, B flat, and F
   C. G, A, B flat and D
   D. B flat, D, F, and G

19. Tendency tones tend to move to an adjacent scale degree by what type of step?
   A. half
   B. whole
   C. step and a half
   D. two whole

20. What is the tonic scale degree in a major scale in which D sharp is the mediant scale degree?
   A. A
   B. C sharp
   C. B
   D. F sharp

LESSON 2

PRACTICE EXERCISE
<table>
<thead>
<tr>
<th>Item</th>
<th>Correct Answer and Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>C. M L M (paragraph 1a)</td>
</tr>
<tr>
<td>2.</td>
<td>D. chromatic signs (paragraph 2)</td>
</tr>
<tr>
<td>3.</td>
<td>A. 1 2 2 1 2 2 (paragraph 1a)</td>
</tr>
<tr>
<td>4.</td>
<td>C. four (paragraph 5c)</td>
</tr>
<tr>
<td>5.</td>
<td>B. one half step above the last sharp in the key signature (paragraph 8a)</td>
</tr>
<tr>
<td>6.</td>
<td>A. scales (paragraph 3b)</td>
</tr>
<tr>
<td>7.</td>
<td>D. F sharp C sharp G sharp D sharp A sharp E sharp B sharp (paragraph 5a)</td>
</tr>
<tr>
<td>8.</td>
<td>B. they are opposite of each other (paragraph 6c note)</td>
</tr>
<tr>
<td>9.</td>
<td>C. scaletone (paragraph 9)</td>
</tr>
<tr>
<td>10.</td>
<td>D. subdominant (paragraph 9)</td>
</tr>
<tr>
<td>11.</td>
<td>C. F (paragraph 9)</td>
</tr>
</tbody>
</table>
12. D. F sharp Major
   (paragraph 5c, Figure 2-10)

13. A. D flat
    (paragraph 9c)

14. D. C and F sharp
    (paragraph 10c)

15. A. D flat, F, A flat
    (paragraph 10a)

16. B. C sharp
    (paragraph 10c)

17. C. F
    (paragraph 3)

18. A. G, B flat, D, and E
    (paragraph 10)

19. A. half
    (paragraph 10c)

20. C. B
    (paragraph 9d)
LESSON 3
MINOR SCALES AND KEY SIGNATURES

OVERVIEW

LESSON DESCRIPTION:
In this lesson you will learn how to identify and construct natural, harmonic, and melodic minor scales. You will write key signatures, identify minor keys using key signatures and identify stable tones, active tones, and tendency tones in minor scales.

TERMINAL LEARNING OBJECTIVE:
ACTION: At the end of this lesson you will be able to identify and construct natural, harmonic, and melodic minor scales, write and identify key signatures of minor keys, and identify scale degree activity in minor keys.

CONDITION: Given the material in this lesson.

STANDARD: IAW the information given in this lesson.

REFERENCES: The material contained in this lesson was derived from Training Circular 12-41 and 12-42.

INTRODUCTION

Three forms of minor scales commonly used in music are: natural minor (also called minor and pure minor), harmonic minor, and melodic minor.

NOTE: Upper and lower case letters are used to differentiate between major and minor keys. Upper case letters represent major keys (C Major). Lower case letters represent minor keys (c minor).

PART A  NATURAL MINOR SCALES

1. Natural Minor Scale Structure.

a. The formula for a natural minor scale is m (minor) L (Link) N (Natural). A natural minor scale is a series of eight consecutive notes with the intervals between notes being two half steps, one half step, two half steps, two half steps, one half step, two half steps, two half steps (Figure 3-1).

b. On a keyboard, the interval relationships correspond to a white key scale from a to a (Figure 3-2).
2. Minor Keys and Key Signatures.

   a. The tonic note of a minor scale gives the key of the scale. For example, a minor scale with a tonic of "c" is in the key of c minor.

   b. To determine the order of sharp minor keys, begin with the key with no flats or sharps ("a" minor). Count up five scale degrees (e minor). Then, start on "e" and count up five more scale degrees. Continue this until all keys are identified (Figure 3-3).

   c. Although the tonics in natural minor differ from major, the placement of sharps remains the same (Figure 3-4).

   d. To find the order of flat minor keys, begin with the key of no flats or sharps ("a" minor). Count up four scale degrees (d minor). Then, start on "d" and count up four more scale degrees. Continue this until all keys are identified (Figure 3-5).
e. Although the tonics in natural minor differ from major, the placement of flats remains the same (Figure 3-6).

3. Circle of Minor Keys. Since the natural, harmonic, and melodic minor scales share the same group of key signatures, it is possible to construct one circle of fifths for all three forms of the scale (Figure 3-7).

4. Deriving Minor Key Names from Key Signatures.
   a. The letter name of the scale degree immediately below the last sharp in the key signature is the minor key name for sharp keys (Figure 3-8).
NOTE: This is opposite to major keys where the letter name above the last sharp is the key name.

b. For minor flat keys, find the name of the key by counting up three scale degrees above the last flat (Figure 3-9).

Figure 3-9: Deriving Names of Flat Keys.

SELF REVIEW EXERCISE #1

Exercise #1. Construct natural minor scales ascending and descending on the tonic notes given below. Add accidentals where they are needed to maintain natural minor scale structure. The first exercise is completed for you.
SELF REVIEW EXERCISE #2

Exercise #2. Write the correct key signature for each minor key. The first exercise is completed for you.
5. **Natural Minor Scale Degree Names.**

The scale degree names for natural minor scales are the same as for major scales except for the seventh scale degree. The seventh scale degree is called the subtonic when it is two half steps (whole step) below the tonic (Figure 3-10).

![Figure 3-10: Natural Minor Scale Degree Names.](image)

6. **Natural Minor Scale Degree Activity.**

a. Compared to a major scale on the same tonic, the natural minor scale has a lowered mediant (third), lowered submediant (sixth) and a subtonic (seventh) (Figure 3-11).

![Figure 3-11: Comparing Major and Natural Minor Scales.](image)

b. The scale degree activity in natural minor scales is different from major scales because the pattern of whole steps and half steps is different (Figure 3-12).
<table>
<thead>
<tr>
<th>STABLE</th>
<th>ACTIVE</th>
<th>STABLE</th>
<th>ACTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonic</td>
<td>Supertonic</td>
<td>Tonic</td>
<td>Supertonic</td>
</tr>
<tr>
<td>Mediant</td>
<td>Subdominant</td>
<td>Mediant</td>
<td>Subdominant</td>
</tr>
<tr>
<td>Dominant</td>
<td>Submediant</td>
<td>Dominant</td>
<td>Submediant</td>
</tr>
<tr>
<td></td>
<td>Leading Tone</td>
<td></td>
<td>Subtonic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TENDENCY TONES</th>
<th>TENDENCY TONES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subdominant pulls to Mediant</td>
<td>Submediant pulls to Dominant</td>
</tr>
<tr>
<td>Leading Tone pulls to Tonic</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3-12: Major and Natural Minor Scale Degree Activity.
PART B--HARMONIC MINOR SCALES


a. The formula for the harmonic minor scale is minor (m), link (L), harmonic (H). The harmonic minor scale is identical in structure to the natural minor scale, except for a raised seventh (leading tone) degree. The intervals between notes of a harmonic minor scale are two half steps, one half step, two half steps, two half steps, one half step, three half steps, one half step (Figure 3-13).

![Figure 3-13: Harmonic Minor Structure.](image)

b. The whole step/half step interval relationships in harmonic minor do not correspond to any white key scale (Figure 3-14).

![Figure 3-14: "a" Harmonic Minor Scale.](image)

NOTE: Natural, harmonic, and melodic minor scales have the same key signature. The raised seventh scale degree of the harmonic scales and the raised sixth and seventh scale degrees in the ascending melodic minor scales are indicated by accidentals. These accidentals will not appear in the key signature.
**SELF REVIEW EXERCISE #3**

Exercise #3. Write the key signatures and accidentals to construct harmonic minor scales ascending and descending for the following keys. The first exercise is completed for you.

<table>
<thead>
<tr>
<th></th>
<th>1. bb harmonic minor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="bb harmonic minor" /></td>
</tr>
<tr>
<td></td>
<td>2. c# harmonic minor</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="c# harmonic minor" /></td>
</tr>
<tr>
<td></td>
<td>3. e harmonic minor</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="e harmonic minor" /></td>
</tr>
<tr>
<td></td>
<td>4. c harmonic minor</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="c harmonic minor" /></td>
</tr>
<tr>
<td></td>
<td>5. a harmonic minor</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="a harmonic minor" /></td>
</tr>
<tr>
<td></td>
<td>6. e# harmonic minor</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="e# harmonic minor" /></td>
</tr>
<tr>
<td></td>
<td>7. f# harmonic minor</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="f# harmonic minor" /></td>
</tr>
<tr>
<td></td>
<td>8. d harmonic minor</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="d harmonic minor" /></td>
</tr>
</tbody>
</table>
8. Harmonic Minor Scale Degree Names. Scale degree names for the harmonic minor scales are the same as for the major scales (Figure 3-15).

9. Harmonic Minor Scale Degree Activity.
   a. The harmonic minor scale evolved because of the lack of tendency tones in natural minor. The harmonic form of the minor scale develops a better balance of tendency tones in minor keys (Figure 3-16).

   **SCALE DEGREE ACTIVITY IN HARMONIC MINOR**

<table>
<thead>
<tr>
<th>STABLE</th>
<th>ACTIVE</th>
<th>TENDENCY TONES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonic</td>
<td>Supertonic</td>
<td>Submediant pulls to dominant</td>
</tr>
<tr>
<td>Mediant</td>
<td>Subdominant</td>
<td></td>
</tr>
<tr>
<td>Dominant</td>
<td>Submediant</td>
<td>Leading Tone pulls to Tonic</td>
</tr>
<tr>
<td>Leading Tone</td>
<td>Leading Tone</td>
<td></td>
</tr>
</tbody>
</table>

   **Figure 3-16: Scale Degree Activity.**

   B The three half steps (augmented second) between the submediant and the leading tone can cause melodic problems.
PART C MELODIC MINOR SCALES

10. Melodic Minor Scale Structure.

a. Ascending. The formula for the ascending melodic minor scale is \textbf{m L M}. Unlike other major and minor scales, the ascending form of the melodic minor scale is different from its descending form. The intervals between the notes of the ascending melodic minor scale are two half steps, one half step, two half steps, two half steps, two half steps, two half steps, one half step (Figure 3-17).

b. Raise the sixth and seventh scales degrees of a natural minor scale one half step to form the ascending melodic minor scale (Figure 3-18).

c. Descending. The formula for a descending melodic minor scale is \textbf{N L m}. The intervals between the notes are the same as the intervals of a descending natural minor scale, or two half steps, two half steps, one half step, two half steps, two half steps, one half step, two half steps (Figure 3-19).
d. The raised sixth (submediant) and raised seventh (leading tone) scale degrees of the ascending melodic minor scale are lowered in the descending melodic minor scale. Therefore, the descending melodic minor scale is identical to the descending natural minor scale (Figure 3-20).

11. Melodic Minor Scale Degree Names.

a. The scale degree names for ascending melodic minor are shown in Figure 3-21.

b. The scale degree names for the descending melodic minor scale are the same as the scale degree names for the descending natural minor scale.
12. Melodic Minor Scale Degree Activity. Figure 3-22 shows the scale degree activity for melodic minor.

**SCALE DEGREE ACTIVITY IN MELODIC MINOR**

<table>
<thead>
<tr>
<th>STABLE</th>
<th>ACTIVE</th>
<th>TENDENCY TONES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tonic</td>
<td>Supertonic</td>
<td>Lowered Submediant pulls to Dominant</td>
</tr>
<tr>
<td>Mediant</td>
<td>Subdominant</td>
<td></td>
</tr>
<tr>
<td>Dominant</td>
<td>Raised Submediant</td>
<td>Leading Tone pulls to Tonic</td>
</tr>
<tr>
<td></td>
<td>Leading Tone</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3-22: Scale Degree Activity.**

**SELF REVIEW EXERCISE #4**

Exercise #4. Write the ascending and descending forms of the melodic minor scales in the following keys. The first exercise is completed for you.

```
1. d melodic minor

2. c melodic minor

3. b melodic minor

4. f melodic minor

5. #4 melodic minor

6. e# melodic minor

7. #5 melodic minor

8. g melodic minor
```
13. Parallel keys are keys that have the same tonic but different key signatures. For example, the key of F major and f minor are parallel keys (Figure 3-23).

![Figure 3-23: Parallel Keys.](image)

14. Relative Keys

a. Major and minor keys that have the same key signature are called relative keys. Relative keys do not have the same tonic (Figure 3-24).

![Figure 3-24: Relative Keys.](image)
b. The sixth scale degree of the major scale is the tonic of the relative minor scale (Figure 3-25).

![Figure 3-25: Relative Key Identification.](image)

NOTE: Because of this relationship, you can determine the minor key signature by first determining the major key signature. The name of the submediant (in the major key) is the name of the relative minor tonic.

c. The third scale degree of the minor scale is the tonic of the relative major (Figure 3-26).

![Figure 3-26: Relative Major and Minor.](image)
SELF REVIEW EXERCISE #5

Exercise #5. Using the key indicated in column one, write the key signature on the staff in column two. Write the relative major or minor key in column three. The first exercise is done for you.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>E♭ Major</td>
<td>E♭</td>
<td>c minor</td>
</tr>
<tr>
<td>d minor</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>b minor</td>
<td>b</td>
<td></td>
</tr>
<tr>
<td>B♭ Major</td>
<td>B♭</td>
<td></td>
</tr>
<tr>
<td>c♯ minor</td>
<td>c♯</td>
<td></td>
</tr>
<tr>
<td>F♯ Major</td>
<td>F♯</td>
<td></td>
</tr>
<tr>
<td>g minor</td>
<td>g</td>
<td></td>
</tr>
<tr>
<td>A♭ Major</td>
<td>A♭</td>
<td></td>
</tr>
<tr>
<td>a♭ minor</td>
<td>a♭</td>
<td></td>
</tr>
<tr>
<td>D Major</td>
<td>D</td>
<td></td>
</tr>
</tbody>
</table>
Exercise #1

1. a natural minor

2. g natural minor

3. b natural minor

4. #f natural minor

5. c natural minor

6. #b natural minor

7. e natural minor

8. e natural minor
9. f natural minor

10. ab natural minor

11. a natural minor

12. d natural minor

13. g natural minor
Exercise #4

1. d melodic minor

2. e melodic minor

3. b melodic minor

4. f melodic minor

5. g# melodic minor

6. b melodic minor

9. a# harmonic minor

10. f harmonic minor
Exercise #5

7. F# melodic minor

8. G melodic minor

9. A melodic minor

10. Bb melodic minor

11. C# melodic minor
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E♭ Major</td>
<td></td>
<td>c minor</td>
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<tr>
<td>2</td>
<td>d minor</td>
<td></td>
<td>F Major</td>
</tr>
<tr>
<td>3</td>
<td>b minor</td>
<td></td>
<td>D Major</td>
</tr>
<tr>
<td>4</td>
<td>B♭ Major</td>
<td></td>
<td>g minor</td>
</tr>
<tr>
<td>5</td>
<td>c♯ minor</td>
<td></td>
<td>E Major</td>
</tr>
<tr>
<td>6</td>
<td>F♯ Major</td>
<td></td>
<td>d♯ minor</td>
</tr>
<tr>
<td>7</td>
<td>g minor</td>
<td></td>
<td>B♭ Major</td>
</tr>
<tr>
<td>8</td>
<td>A♭ Major</td>
<td></td>
<td>f minor</td>
</tr>
<tr>
<td>9</td>
<td>a♭ minor</td>
<td></td>
<td>C♭ Major</td>
</tr>
<tr>
<td>10</td>
<td>D Major</td>
<td></td>
<td>b minor</td>
</tr>
</tbody>
</table>
LESSON 3
PRACTICE EXERCISE

The following items will test your understanding of the material covered in this lesson. There is only one correct answer for each item. When you have completed the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, review that part of the lesson which contains the portion involved.

Figure 1: Question 1 through 3.

1. Which example in Figure 1 is a natural minor scale?
   A. 1
   B. 2
   C. 3
   D. 4

2. Which example in Figure 1 is a harmonic minor scale?
   A. 1
   B. 2
   C. 3
   D. 4

3. Which example in Figure 1 is an ascending melodic minor scale?
   A. 1
   B. 2
   C. 3
   D. 4

4. What minor scale is identical to the descending melodic minor scale?
   A. ascending melodic
   B. harmonic
C. descending natural
D. descending harmonic

5. What is the pattern of half steps of a natural minor scale?
   A. 2 1 2 2 1 2 2
   B. 2 2 1 2 2 1
   C. 2 1 2 2 2 1 2
   D. 2 2 1 2 1 2 2

6. What types of keys have the same tonic but different key signatures?
   A. relative
   B. parallel
   C. harmonic
   D. melodic

7. What is the tonic pitch of the relative minor scale of E flat Major?
   A. e flat
   B. c
   C. a flat
   D. f

8. What is the subdominant pitch of the relative major scale of f sharp minor?
   A. c sharp
   B. b
   C. d
   D. f sharp

9. What is the dominant pitch of the parallel minor of G Major?
   A. a
   B. b
   C. d
   D. e

10. What scale degree is the tonic pitch of the relative minor of D Major?
A. third  
B. fourth  
C. fifth  
D. sixth

11. Which keys do NOT have the same tonic.  
   A. relative  
   B. parallel  
   C. harmonic  
   D. Melodic

12. What is the parallel minor of E flat Major.  
   A. c  
   B. b flat  
   C. e flat  
   D. a flat

13. What can cause melodic problems in a harmonic minor scale?  
   A. lack of leading tones  
   B. interval of an augmented second between the submediant and leading tone  
   C. different ascending and descending forms  
   D. difficulty in determining the key signature because of the raised seventh degree

14. What is the pattern of whole steps and half steps of a harmonic minor scale.  
   A. 2 2 1 2 3 3 1  
   B. 2 1 2 2 3 2 1  
   C. 2 1 2 1 3 1  
   D. 2 2 1 2 1 3 1

15. What is the parallel key of F Major?  
   A. d  
   B. e  
   C. f
**LESSON 3**

**PRACTICE EXERCISE**

**ANSWER KEY AND FEEDBACK**

<table>
<thead>
<tr>
<th>Item</th>
<th>Correct Answer and Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>B. 2 (paragraph(s) 1a &amp; b)</td>
</tr>
<tr>
<td>2.</td>
<td>A. 1 (paragraph(s) 7a &amp; b)</td>
</tr>
<tr>
<td>3.</td>
<td>D. 4 (paragraph 10a)</td>
</tr>
<tr>
<td>4.</td>
<td>C. descending natural (paragraph 10b 2)</td>
</tr>
<tr>
<td>5.</td>
<td>A. 2 1 2 1 2 2 (paragraph 1a)</td>
</tr>
<tr>
<td>6.</td>
<td>B. Parallel (paragraph 13)</td>
</tr>
<tr>
<td>7.</td>
<td>B. c (paragraph 14b)</td>
</tr>
<tr>
<td>8.</td>
<td>C. d (paragraph(s) 14b &amp; c)</td>
</tr>
<tr>
<td>9.</td>
<td>C. d (paragraph 13)</td>
</tr>
<tr>
<td>10.</td>
<td>D. sixth (paragraph 14b)</td>
</tr>
</tbody>
</table>
11. A. Relative  
   (paragraph 14a)

12. C. e flat  
   (paragraph 13)

13. B. interval of an augmented second between the submediant and leading tone  
   (paragraph 9b)

14. C. 2 1 2 1 3 1  
   (paragraph 7a)

15. C. f  
   (paragraph 13)
LESSON 4
MODAL SCALES

OVERVIEW

LESSON DESCRIPTION:
In this lesson, you will learn to identify and write modal scales.

TERMINAL LEARNING OBJECTIVE:
ACTION: You will identify and write modal scales.
CONDITION: Given the material in this lesson.
STANDARD: IAW the information in this lesson.
REFERENCES: The material contained in this lesson was derived from TC 12-41 and TC 12-42.

INTRODUCTION

In the Middle Ages, music was often composed of eight tone scales that did not follow the pattern of major and minor scales. These early scales were called modes. Modal scales have since been used in many periods and styles of music.

Most modal scales are classified as major or minor. The major modal scales are: Lydian, Ionian, and Mixolydian. The minor modal scales are: Dorian, Aeolian, and Phrygian. The Locrian modal scale is neither major nor minor, it tends toward minor and will be discussed with the minor modal scales.

PART A MAJOR MODES

1. Lydian.
   a. The formula for the Lydian modal scale is LMM (Figure 4-1).

![Diagram of Lydian Scale]

   Figure 4-1: Lydian Formula.

   b. The Lydian scale's half step/whole step interval relationship corresponds to a white scale from F to F on a piano keyboard (Figure 4-2).
c. A Circle of Lydian Keys can be constructed to represent the remaining Lydian scales by using the Major Circle of Fifths and shifting the number of sharps and flats one key to the right. You can figure out the number of flats or sharps by subtracting one flat or adding one sharp to the parallel major scale. The F Lydian scale has no flats or sharps (Figure 4-3).

d. The Lydian scale has a raised subdominant (sharp 4) when compared to its parallel (same tonic) major scale (Figure 4-4).
Exercise #1. Constructing Lydian scales. The first note is indicated in each exercise. The first exercise is completed for you.

2. Ionian.
   a. The formula for the Ionian modal scale is MLM.
   b. The Ionian modal scale is identical to a major scale.

   a. The formula for the Mixolydian modal scale is MML or MLm (Figure 4-5).

Figure 4-5: Mixolydian Formula.
b. The Mixolydian scale's half step/whole step relationship corresponds to a white key scale from G to G on the piano keyboard (Figure 4-6).

![Figure 4-6: Mixolydian Mode on Piano Keyboard.](image)

c. A Circle of Mixolydian Keys can be constructed to represent the remaining Mixolydian Keys by using the Major Circle of Fifths and shifting the number of sharps and flats one key to the left. You can figure out the numbers of flats or sharps by subtracting one sharp or adding 1 flat to the parallel major scale. The G Mixolydian scale has no sharps or flats (Figure 4-7).

![Figure 4-7: Circle of Mixolydian Keys.](image)
d. The Mixolydian scale has a subtonic (flat 7), instead of a leading tone, when compared to its parallel major scale (Figure 4-8).

SELF REVIEW EXERCISE #2

Exercise #2. Constructing Mixolydian scales. The first note is indicated in each exercise. The first exercise is
PART B MINOR MODES

4. Dorian.

a. The formula for the Dorian modal scale is mLm (Figure 4-9).

b. The Dorian scale's half step/whole step relationship corresponds to a white key scale from D to D on a piano keyboard (Figure 4-10).
c. A Circle of Dorian Keys can be constructed to represent the remaining Dorian Keys by using the Major Circle of Fifths and shifting the number of sharps and flats two keys to the left. You can figure out the number of sharps and flats by subtracting two sharps or adding two flats to the parallel major scale. The Dorian scale has no flats or sharps (Figure 4-11).

![Circle of Dorian Keys](image)

Figure 4-11: Circle of Dorian Keys.

d. The Dorian scale has a lowered mediant (flat 3) and subtonic (flat 7) when compared to its parallel major scale (Figure 4-12).

![Dorian and Parallel Major](image)

Figure 4-12: Dorian and Parallel Major.
e. The Dorian scale has a raised submediant (sharp 6) when compared to its parallel natural minor scale (Figure 4-13).

SELF REVIEW EXERCISE #3

Exercise #3. Constructing Dorian scales. The first note is indicated in each exercise. The first exercise is
5. Aeolian.
   a. The formula for the aeolian modal scale is mLN.
   b. The aeolian modal scale is identical to the natural minor scale.

6. Phrygian.
   a. The formula for the Phrygian modal scale is NLN (Figure 4-14).
   b. The Phrygian scale's half/whole step relationship corresponds to a white key scale from E to E on the piano keyboard (Figure 4-15).
c. A Circle of Phrygian Keys can be constructed by using the Major Circle of Fifths and shifting the number of flats four keys to the left. You can figure out the number of flats or sharps by adding four flats or subtracting four sharps to the parallel major scale. The e Phrygian scale has no flats or sharps (Figure 4-16).

d. The Phrygian scale has a lowered subtonic (flat 2), mediant (flat 3), submediant (flat 6), and subtonic (flat 7) when compared to its parallel major scale. (Figure 4-17).

Figure 4-16: Circle of Phrygian Keys.

Figure 4-17: Phrygian and Parallel Major.
e. The Phrygian scale has a lowered supertonic (flat 2) when compared to its parallel natural minor scale (Figure 4-18).

Figure 4-18: Phrygian and Parallel Minor.
Exercise #4. Constructing Phrygian scales. The first note is indicated in each exercise. The first exercise is completed for you.

7. Locrian
   a. The formula for the Locrian modal scale is NNL (Figure 4-19).

   ![Figure 4-19: Locrian Formula.]

   b. The Locrian scale's half/whole step relationship corresponds to a white scale key from B to B on a piano keyboard (Figure 4-20).

   ![Figure 4-20: Locrian Mode on Piano Keyboard.]
c. A Circle of Locrian keys can be constructed by using the Major Circle of Fifths and shifting the number of flats five keys to the left. You can figure out the number of flats or sharps by adding five flats or subtracting five sharps to the parallel major scale. The b Locrian scale has no flats or sharps (Figure 4-21).

d. The Locrian scale has a lowered supertonic (flat 2), mediant (flat 3), dominant (flat 5), submediant (flat 6), and subtonic (flat 7) when compared to its parallel major scale. The subdominant is the only scale degree...
that remains unaltered (Figure 4-22).

SELF REVIEW #5

Exercise #5. Constructing Locrian scales. The first note is indicated in each exercise. The first exercise is completed for you.

8. IDPLMAL.
a. An easy way to remember modal scales is to use a mnemonic **IDPLMAL**, which stands for **I Don’t Punch Like Muhammad Ali**. Each letter stands for a modal scale: I for Ionian, D for Dorian, P for Phrygian, L for Lydian, M for Mixolydian, A for Aeolian and L for Locrian.

b. By assigning the numbers from 1 to 7 for each letter of **IDPLMAL**, you can determine the scale degree of a major scale a modal scale starts on and then build a model for that modal scale (Figure 4-23).

<table>
<thead>
<tr>
<th>MODAL SCALE</th>
<th>SCALE DEGREE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ionian</td>
<td>1</td>
</tr>
<tr>
<td>Dorian</td>
<td>2</td>
</tr>
<tr>
<td>Phrygian</td>
<td>3</td>
</tr>
<tr>
<td>Lydian</td>
<td>4</td>
</tr>
<tr>
<td>Mixolydian</td>
<td>5</td>
</tr>
<tr>
<td>Aeolian</td>
<td>6</td>
</tr>
<tr>
<td>Locrian</td>
<td>7</td>
</tr>
</tbody>
</table>

![Figure 4-23: IDPLMAL.](image)

c. Another way to remember modal scales is to relate them to a major scale and how each scale degree is altered. (Figure 4-24).

<table>
<thead>
<tr>
<th></th>
<th>TONIC</th>
<th>SUPERTONIC</th>
<th>MEDIANT</th>
<th>SUBDOMINANT</th>
<th>DOMINANT</th>
<th>SUBMEDIANT</th>
<th>LEADING TONE OR SUBTONIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lydian</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Ionian (Major)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Mixolydian</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Dorian</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Aeolian (Natural Minor)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Phrygian</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Locrian</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

![Figure 4-24: Comparison of Modal Scale Degrees to Major Scale Degrees.](image)

**SELF REVIEW EXERCISE #6**

Exercise #6. Convert the major scale to the appropriate modal scale by adding accidentals. The first exercise is completed for you.
ANSWERS TO SELF REVIEW EXERCISES

Answers To Exercise #1.

Answers To Exercise #2.
Answers To Exercise #3.
Answers To Exercise #4.
Answers To Exercise #5.
Answers To Exercise #6.

1. f locrian

2. A Mixolydian

3. G Lydian

4. c dorian

5. b♭ phrygian

6. E♭ Mixolydian
LESSON 4

PRACTICE EXERCISE

The following items will test your understanding of the material covered in this lesson. There is only one correct answer for each item. When you have completed the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, review that part of the lesson which contains the portion involved.

1. The Ionian scale uses which formula?
   A. M L M
   B. m L M
   C. M L m
   D. L M M

2. What does the Lydian modal scale have when compared to its parallel major scale?
   A. lowered subdominant
   B. raised subdominant
   C. subtonic
   D. lowered supertonic

3. The Phrygian scale corresponds to a white key scale on the keyboard starting and ending on which note?
   A. D
   B. E
   C. F
   D. B

   Figure 1: Question 4.

4. Which scale is represented in Figure 1?
   A. Mixolydian
   B. Dorian
C. Locrian
D. Phrygian

5. The Mixolydian scale uses which formula?
   A. M L M
   B. m L M
   C. M L m
   D. L m M

LESSON 4

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

<table>
<thead>
<tr>
<th>Item</th>
<th>Correct Answer and Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A. MLM</td>
</tr>
<tr>
<td></td>
<td>(paragraph 2a)</td>
</tr>
<tr>
<td>2.</td>
<td>B. Raised subdominant</td>
</tr>
<tr>
<td></td>
<td>(paragraph 1d)</td>
</tr>
<tr>
<td>3.</td>
<td>B. E</td>
</tr>
<tr>
<td></td>
<td>(paragraph 6b)</td>
</tr>
<tr>
<td>4.</td>
<td>B. Dorian</td>
</tr>
<tr>
<td></td>
<td>(paragraph 4a)</td>
</tr>
<tr>
<td>5.</td>
<td>C. M L m</td>
</tr>
<tr>
<td></td>
<td>(paragraph 3a)</td>
</tr>
</tbody>
</table>
LESSON 5
CHROMATIC, WHOLE TONE AND PENTATONIC SCALES

OVERVIEW

LESSON DESCRIPTION:
In this lesson you will learn to identify and write chromatic, whole tone, and pentatonic scales.

LEARNING OBJECTIVE:
ACTION: At the end of this lesson, you will be able to identify and write chromatic, whole tone and pentatonic scales.
CONDITION: Given the information in this lesson.
STANDARD: IAW the information in this lesson.
REFERENCES: The material contained in this lesson was derived from Training Circular 12-41 and 12-42.

INTRODUCTION
Chromatic, whole tone, and pentatonic scales cannot be analyzed using tetrachords. These scales do not form regular keys and do not have regular key signatures. Chromatic and whole tone scales require accidentals when used with key signatures.

PART A CHROMATIC SCALE

1. The Chromatic Scale.
   a. The chromatic scale consists entirely of half steps. There are twelve half steps or thirteen pitches in an octave. If all thirteen pitches are represented in ascending or descending order, the result is a chromatic scale. The name of the chromatic scale is the first note of the scale regardless of the key signature (Figure 5-1).

   Figure 5-1: D Chromatic Scale.

   b. When notating chromatic scales, any pitch requiring an accidental is written as a chromatic alteration of the previous pitch (Figure 5-2). Use sharps when ascending and flats when descending.

   Figure 5-2: Accidentals in a Chromatic Scale.
c. Avoid double sharps and double flats when notating chromatic scales. Use natural signs on adjacent staff degrees to avoid double sharps and double flats.

**SELF REVIEW EXERCISE #1**

Exercise #1. Constructing Chromatic scales. The first note is indicated in each exercise. The first exercise is completed for you.

1. 

2. 

3. 

4. 

**PART B - WHOLE TONE SCALE**

2. The Whole Tone Scale.
   
   a. The whole tone scale, as it name implies, is constructed using whole steps. Accidentals are used to create whole steps (Figure 5-3).

   **Figure 5-3: Whole Tone Scale.**
b. The whole tone scale consists of seven pitches instead of eight (including the octave). One of the staff degrees within the scale will not contain a note.

SELF REVIEW EXERCISE #2

Exercise #2. Constructing Whole Tone scales. The first note is indicated for you. The first exercise is completed for you.

PART C-PENTATONIC SCALES

A Pentatonic scale consists of five tones (six pitches including the octave). Two common Pentatonic scales are the Pentatonic Major and the Pentatonic minor.

3. Pentatonic Major Scale.
   a. A Pentatonic Major scale is constructed starting on the first degree of a Major scale. A Pentatonic Major scale contains the tonic (1), supertonic (2), mediant (3), dominant (5), and the submediant (6) of a Major scale (Figure 5-4).
c. The tones omitted are the tendency tones in a Major Scale: the subdominant (4) and the leading tone (7).
SELF REVIEW EXERCISE #3

Exercise #3. Constructing Pentatonic Major scales. The first note is indicated in each exercise. The first is completed for you.

4. Pentatonic Minor Scale.
   
a. A Pentatonic minor scale is constructed starting on the first degree of a natural minor scale. A Pentatonic minor scale contains the tonic (1), mediant (flat 3), subdominant (4), dominant (5), and subtonic (flat 7) of a natural minor scale (Figure 5-6).

   Figure 5-6: Scale Degrees in Pentatonic Minor.

b. The Pentatonic minor scale corresponds to a black key scale on the piano keyboard from E flat to E flat (Figure 5-7).

   Figure 5-7: E flat Pentatonic Minor Scale on Piano Keyboard.
c. The tones omitted are the active tone and tendency tone which form half steps in natural minor: the supertonic (2) and submediant (flat 6).

SELF REVIEW EXERCISE #4

Exercise #4. Constructing Pentatonic minor scales. The first note is indicated in each exercise. The first exercise is completed for you.

1. \[ \text{Diagram} \]
2. \[ \text{Diagram} \]
3. \[ \text{Diagram} \]
4. \[ \text{Diagram} \]
5. \[ \text{Diagram} \]
6. \[ \text{Diagram} \]
7. \[ \text{Diagram} \]
8. \[ \text{Diagram} \]

ANSWERS TO SELF REVIEW EXERCISES
Answers To Exercise #1.


Answers To Exercise #2.


Answers To Exercise #3.
Answers To Exercise #4.
LESSON 5

PRACTICE EXERCISE

The following items will test your understanding of the material covered in this lesson. There is only one correct answer for each item. When you have completed the exercise, check your answers with the answer key that follows. If you answer any item incorrectly, review that part of the lesson which contains the portion involved.

1. How many pitches are in a chromatic scale?
   A. 11
   B. 12
   C. 13
   D. 14

2. This is what scale? (Refer to Figure 1).
   A. E Whole Tone
   B. E flat Whole Tone
   C. E Pentatonic Major
   D. E flat Pentatonic Major

3. This is what scale? (Refer to Figure 2).
   A. C Pentatonic Major
   B. A Pentatonic Minor
   C. C Pentatonic Minor
   D. A Pentatonic Major
<table>
<thead>
<tr>
<th>Item</th>
<th>Correct Answer and Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>C. 13</td>
</tr>
<tr>
<td></td>
<td>(paragraph 1a)</td>
</tr>
<tr>
<td>2.</td>
<td>A. E Whole Tone</td>
</tr>
<tr>
<td></td>
<td>(paragraph 2a)</td>
</tr>
<tr>
<td>3.</td>
<td>B. C Pentatonic Minor</td>
</tr>
<tr>
<td></td>
<td>(paragraph 4a)</td>
</tr>
</tbody>
</table>