



# Fractions of time: Musical notes

J. Farnham

# *How do mathematical fractions relate to and work in music?* Essential question

- Students will discover the connection of mathematical fractions to music by applying their knowledge of fractions to equivalent musical notes of rhythm.
  - Listen critically to music
    - distinguish if music is similar or different—opening activity
    - distinguish the length of time each note is heard—core activity
  - Learn different types of rhythm notes, musical measures, and musical nomenclature
    - Traditional instruction, listen to music, view musical sheet music, and write music.
- Products
  - Students will make flashcards showing a fraction and the appropriate musical note on either side of the flashcard.
  - Working in groups of three, students will write six measures of music using a mixture of all the musical notes of rhythm discussed (whole, half, quarter, eighth notes, quarter rest, and half rest) with each measure totaling four beats.

# Lesson Objectives

- “The student will gain the ability to describe the same amount [in each musical measure] by using different-sized fractional parts,” (MDCC) in this case musical notes: whole, half, quarter, and eighth notes and rests.
- “The student will gain the ability to use [musical notes as] a model to investigate relationships of equivalency and reasoning about fractions,” (MDCC).
- The student will “write simple rhythm patterns...using quarter notes, two connected eighth notes, half notes, and corresponding rests in 4/4 time (2 measures),” (MDCC).

# Vocabulary

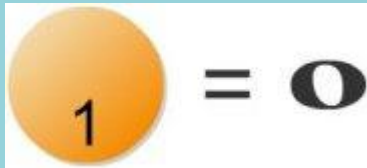
- **Whole note:** a musical note played the length of four quarter notes.
- **Half note:** a musical note played the length of two quarter notes.
- **Quarter note:** a musical note receiving one beat.
- **Eighth note:** a musical note played the length of half a quarter note.
- **Quarter rest:** a musical symbol which means to play no sound for the length of a quarter note.
- **Half rest:** a musical symbol which means to play no sound for length of two quarter notes.
- **Rhythm:** the beat of the music; how fast or slow each notes takes to play.
- **Musical staff:** The *staff* is the foundation for musical notes. It is made up of five lines and four spaces.
- **Musical measures or bars:** A section of the staff which holds a certain number of beats.
- **Treble clef:** A musical symbol

# Opening Activity—Critical Listening Skills

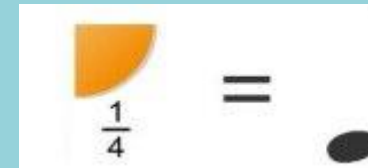
- <http://creatingmusic.com/BlockGames/ComparingGame/>
- Open the lesson with this fun filled game comparing musical measures for sameness.
- This will prepare the students for critical listening.
- **The teacher says,** *“First, we are going to practice our listening by listening to some music and I want you to tell me if the music is the same or if it is different. Listen closely.”*

# Fractions = Musical Notes

Whole Pie = Whole Note



Quarter Pie = Quarter Note = Quarter Rest



Half Pie = Half Note = Half Rest



Eighth Pie = Eighth Note



Two Eighth Notes



*“As you know, fractions are parts of a whole, such as a pie or a square, or a whole anything. In music, many notes are fractions of a whole note and these notes are distinguished based on the length of time they are played. So a whole note is a length of time; a half note is half that length of time, and so on”.*

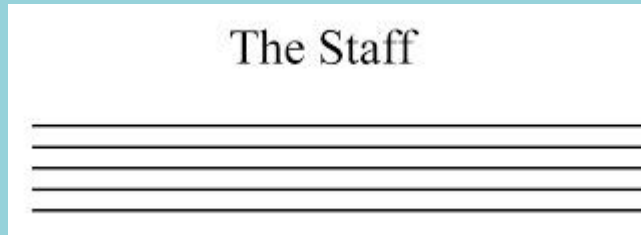
# Product #1 FLASH CARDS

- The teacher instructs the students how to make their flashcards by saying,
  - *“Now students, you are each going to make six flashcards with musical notes on one side and fractions on the other side.”*
  - *“Take the next five minutes to make six flashcards each one showing a different fraction with the corresponding musical note on it.”*
  - 1. Whole, 2. Half, 3. Quarter, 4. Eighth, 5. Half Rest, 6. Quarter Rest.
- The teacher motions to the board where a set of completed flashcards is exhibited.

# Musical Nomenclature



Treble Clef



The teacher will introduce the word “staff” by pointing to the one drawn on the board while telling the students, *“These lines are called a staff, it is the foundation for musical notes. There are five lines and four spaces”*

**Number of Beats Per Measure**

Quarter note gets one beat

○ Whole Note = 4 Beats

◐ Half Note = 2 Beats

● Quarter Note = 1 Beat

♪ Eighth Note = 1/2 Beat

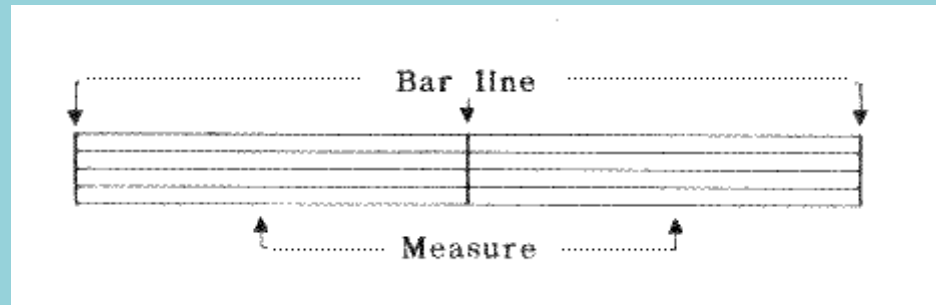
Two Eighth Notes



= 1 Beat



# Bar lines and measures



The teacher explains by saying, *“And these bars are called the bar lines which separate each area which is called a measure. In each measure there is a certain number of beats and each measure is equal to a whole.”*

*“How many quarter notes would we have to include in the measure if it is to add up to a whole?”*

# Even more musical nomenclature



The teacher then goes on to talk about how to group these notes together to equal four beats per measure. The teacher demonstrates by writing on the board, filling a staff with a collection of notes, with each measure adding up to four beats; an example is below.

4 beats in a measure

4 quarters = two halves = one whole = 2 quarters and four eighths = and so on

A quarter note gets one beat

A musical staff in 4/4 time signature. The first measure contains four quarter notes. The second measure contains two half notes. The third measure contains one whole note. The fourth measure contains two quarter notes and four eighth notes. Arrows point from the text "4 beats in a measure" to the 4/4 time signature. Another arrow points from the text "A quarter note gets one beat" to a quarter note in the first measure.

Count: 1 2 3 4 1 2 3 4

Quarter Note Half Note Whole Note

A musical staff in 4/4 time signature. The first measure contains two quarter notes, with the first one labeled "1" and the second "2". The second measure contains one half note, labeled "3". The third measure contains one whole note, labeled "4". The fourth measure contains one whole note, labeled "1". The fifth measure contains two quarter notes, labeled "2" and "3". The sixth measure contains two quarter notes, labeled "4". Below the staff, red lines connect the labels "Quarter Note", "Half Note", and "Whole Note" to their respective notes in the staff.

# More critical listening

## See the music

- Show the sheet music for
  - *I got a letter*

## Hear the music

- Listen to the song
  - *I got a letter*
  - [http://www.greatoakmusic.com/Recorder\\_Songs.html](http://www.greatoakmusic.com/Recorder_Songs.html)

Students learn visually, audibly, and with common lecture.

Before playing the song, the teacher will instruct the students about what they should notice. The teacher might say, “*See this note here, it is a whole note, just like the whole pie,*” as she points to the whole pie and whole note introduced in the opening.

# Product #2 Become a Composer

- Groups of Three
- Each group will compose six measures of music showing different combinations of the notes and rests learned.
  - Each student is responsible for two of the six measures.
  - All notes and rests discussed should be utilized.
- The teacher motions to the board where an example of completed work is exhibited.
- [http://imslp.org/wiki/Woodwind\\_Trio\\_\(Simpson,\\_Daniel\\_L%C3%A9o\)](http://imslp.org/wiki/Woodwind_Trio_(Simpson,_Daniel_L%C3%A9o))
  - For background music while you write!

- *How do mathematical fractions relate to and work in music?*
  - Essential question
- Musical notes of rhythm
  - Whole note
  - Half note
  - Quarter note
  - Eighth note



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# Musical Notes



# Whole note gets 4 beats

