

## Meter Math for Merfolk

**MATHEMATICS:** Fractions & Pre-Algebra

**USE THIS LESSON TO:** Explore math through a kinesthetic and aural approach and connect *The Little Mermaid JR.* to your math curriculum.

**TIME:** 45 minutes

**MATERIALS:**

- Chalkboard or whiteboard
- Images of whole notes, half notes, quarter notes, and eighth notes (included)
- Mermusic Worksheet (included)
- *The Little Mermaid JR.* Rehearsal CD
- CD player

**OBJECTIVES:** Students will:

- Work independently, in small groups, and as a class to transfer mathematic learning to the creative process
- Understand time signatures and the mathematic values of music notes and rests
- Use algebraic skills to solve for symbols through kinesthetic and aural learning
- Apply algebraic skills to content outside of the mathematics curriculum
- Develop and implement music literacy

**INTRODUCTION:** You use math almost every day, and you may not even realize it. Every time you listen to music or tap your foot to a beat, you are experiencing math being turned into art. In *The Little Mermaid JR.*, the music and choreography require rhythm and counting. Let's explore how math helps transport us under the sea.

**WARM-UP:** (15 minutes) The Rhythm of the Sea

1. Have students walk about the room silently. Ask them to notice if they are walking in any particular rhythm.
2. Now, play "Kiss the Girl" from your *The Little Mermaid JR.* Rehearsal CD
3. Ask students to walk in time to the rhythm of the music. Count "one, two, three, four, one, two, three, four" aloud as your class walks about the space.
4. Stop the music and have the group form a standing circle. Write "4/4" on the chalkboard and point out that the group was just walking in 4/4 time. This time signature (musical notation that specifies how many beats are in each measure and which note value constitutes one beat) is a tool composers use to tell musicians how to play the music.
5. Ask the group if the time signature reminds them of anything else? It really is a kind of fraction!
6. Circle the top 4 in the time signature and tell the class that this number represents the number of beats in a measure of music. In "Kiss the Girl" there are four beats per measure. Play a portion of the song again and count, "one, two, three, four, one, two, three, four" aloud.
7. Circle the bottom 4 in the time signature and tell the class that this number tells us which kind of note equals one beat. In "Kiss the Girl" a quarter note, represented by the number 4, equals one beat.

**HOOK:** (10 minutes) Numbers and Notes

1. Display the included note images around the room.
2. Divide your students into four groups. Have one group stand at each of the note images.
3. Ask the class to clap out 4/4 time. As your students clap, count “one, two, three, four, one, two, three, four” to ensure everyone is on the same page. Remind the group that each clap is a quarter note.
4. Next, ask each group to sing or hum one measure of their note in 4/4 time. For example:
  - The whole note group will sing one continuous “la” for four counts.
  - The half note group will sing two “la”s, each lasting two counts.
  - The quarter note group will sing four “la”s, each lasting one count.
  - The eighth note group will sing eight “la”s, each lasting half a count.

**MAIN ACTIVITY:** (17 minutes) Mermusic & Algebra

1. Distribute one Mermusic Worksheet to each group.
2. Work as a class to solve question one. Explain that, for this exercise, students can write the notes anywhere on the staff that they would like. The important thing is the number of notes required to complete the measure.
3. Now, have students work in their small groups to complete question 2 on the worksheet. Float among the groups to help as needed. Encourage any struggling students to clap or walk in rhythm – this will help your kinesthetic learners grasp mathematical concepts.
4. After the class has completed question two, tell them they will notice some new symbols in question 3. These are rests, or moments in the music in which there is no sound. Just like notes, each rest has a different number of counts. There are whole rests, half rests, quarter rests, and eighth rests.
5. Using what they know about notes and 4/4 time, each group should work on question 3 and determine the value of the various rests. If you run short on time, you can assign the remainder of the worksheet as homework.

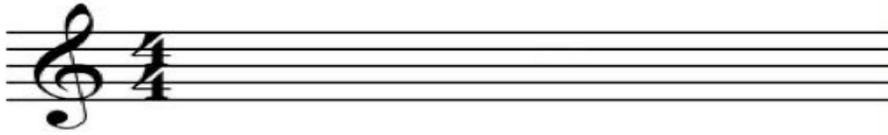
**REFLECTION:** (3 minutes) Dialogue

Engage the group in a discussion using the following prompt:

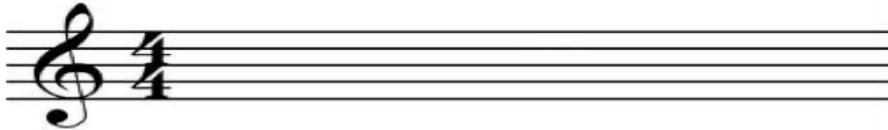
- Using what you know about whole notes, half notes, quarter notes, and eighth notes, which rest is a whole rest? A half rest? A quarter rest? An eighth rest?

## Mermusic Worksheet

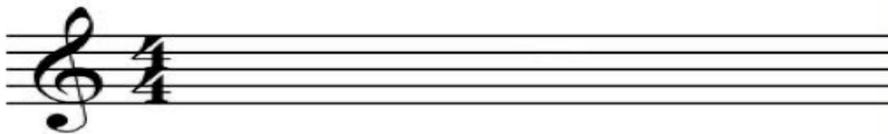
1. Complete this measure using only whole notes:



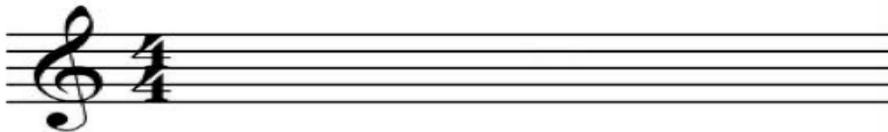
2. Complete this measure using only half notes:



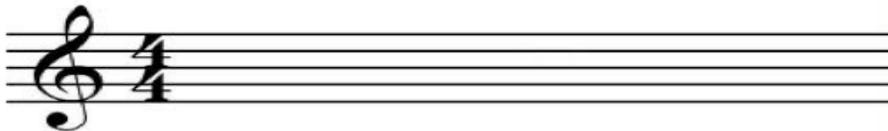
3. Complete this measure using only quarter notes:



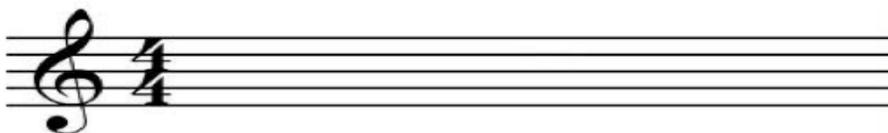
4. Complete this measure using only eighth notes:



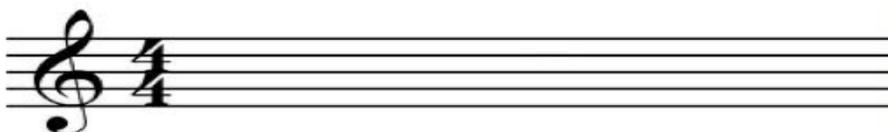
5. Complete this measure using any combination of half notes and quarter notes:



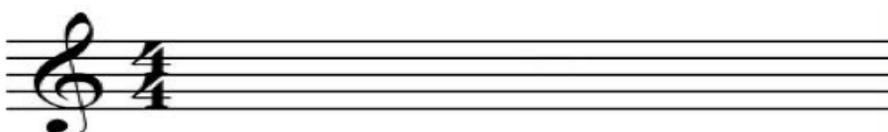
6. Complete this measure using any combination of half notes and eighth notes:



7. Complete this measure using any combination of quarter notes and eighth notes:



8. Complete this measure using any combination of notes that you would like:





1. How many counts does  have?

- A. 4
- B. 2
- C. 1
- D.  $\frac{1}{2}$



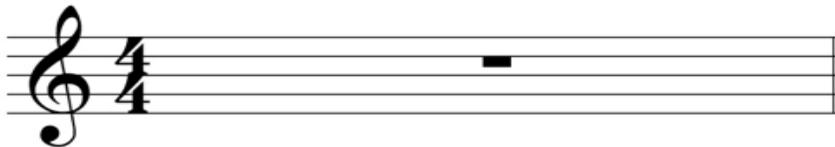
2. How many counts does  have?

- A. 4
- B. 2
- C. 1
- D.  $\frac{1}{2}$



3. How many counts does  have?

- A. 4
- B. 2
- C. 1
- D.  $\frac{1}{2}$



4. How many counts does  have?

- A. 4
- B. 2
- C. 1
- D.  $\frac{1}{2}$

## Mermusic Worksheet - Answer Key

1. Students must include 1 whole note.
2. Students must include 2 half notes.
3. Students must include 4 quarter notes.
4. Students must include 8 eighth notes.
5. Students must include 1 half note and 2 quarter notes.
6. Students must include 1 half note and 4 eighth notes.
7. Students can include 1, 2 or 3 quarter notes with 6, 4, or 2 eighth notes.
8. Students can list any combination, as long as the total equals 4 beats.

1. C : 1 count
2. B: 2 counts
3. D:  $\frac{1}{2}$  a count
4. A: 4 counts



**Whole Note  
= 4 counts**



**Half Note =  
2 counts**



**Quarter Note  
= 1 count**



**Eighth Note**  
**=  $\frac{1}{2}$  a count**