



MCIEA Task: Are you a composer?

Course/subject/grade level: 3rd grade Math

Context/prerequisite skills: Students (and teachers) should have some background in music. Elements of this task can be used to teach math without a background in music, but the overall task is heavily embedded in music. The task may be implemented in collaboration with a music teacher.

Performance Assessment Quality Criteria

High-quality performance tasks should:

- Align to high-leverage learning goals (competencies, learning targets, standards, transferable skills, etc)
- Be open ended and relevant to the real world
- Require application and transfer using higher-order thinking
- Be fair and culturally responsive
- Outline clear criteria for success in a rubric
- Result in original products, performances, or solutions

Learning Goals

What is being assessed in this task? This includes competencies, standards, learning targets, transferable skills, etc. Remember - application and transfer of high-leverage skills are a hallmark of performance assessments.

- **3.NF.1:** Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.
- **3.NF.3:** Explain equivalence of fractions in special cases
 - **3.NF.3a:** Represent two fractions as equivalent (equal) if they are the same size
 - **3.NF.3B:** Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent
- **Critical Thinking**

Task Summary

Describe the essence of the task. What authentic role is the student taking? Who is the audience? What is the problem they are trying to solve?

Over the course of 3-4 class periods, students will show their knowledge of fractions as they take on the role of music composer. They will show how unit fractional notes make up a whole and generate equivalent fractions for a $4/4$ beat.



To adapt this task for your classroom, click [here for an editable version](#).

Original task created by Jennafir Enck.

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Essential Questions

What challenging and open-ended questions are students exploring in this task? How does this assessment engage students in tackling the essential question?

How are fractions used in our everyday life? And how can I relate fractions to a whole using different representations?

What different fractional units can be composed together to make a whole note?

Quality Output

What original product or solution will students produce as a result of this task? Describe what a quality output looks like, sounds like, feels like.

Students will show their understanding of fractions by producing an original music composition of 20 bars. In addition to producing original music, students will show their knowledge of fractions through the completion of several music-related word problems, which calls for them to not only complete the math but explain their thought process.

Quality Process

Without being overly prescriptive, what will students actually do as they complete this task? Describe the flexible quality process learners will engage in to produce the output.

- Step 1:** Introduction & Part 1 (formative)
- Step 2:** Part 2 (parts of a whole) (formative)
- Step 3:** Parts 3 + 4 (Music composition + dilemma)
- Step 4:** Extension (Composition story problem)

Teachers can use all parts of this task for a performance assessment unit, but the task can also be used as multiple assessments. This task can be extended by having students perform their music for peers.

Resources/Materials

What do all students need to have access to in order to complete the task?

Students should be able to complete the task with the materials provided. Additional materials may be needed based on accommodations.

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Possible Accommodations

Understanding that accommodations will always need to be adapted for student's individual needs, what are some accommodations that may be provided for this task?









- Graphic organizers
- Sentence starters
- Special Education/ELL students work in small groups and are given appropriate support as needed.
- Fractional tiles

Name: _____



Are you a Composer? Student Instructions

You are in the running to create your own piece of music for the Boston Pops. They want you to create a new piece of music that is 20 bars long and uses the notes and rests on the chart below. Part of your responsibility is to demonstrate your understanding of musical notes and beats. You will need to fill in a chart with each note, the beat, and what it would look like in a bar. The winner will have their music performed at an upcoming Boston Pops concert.

Name	Note	Rest
Whole		
Half		
Quarter		
Eighth		

Name: _____

Part 1: Notes and Fractions

- Use the fraction bars to show the notes value
- Use the fraction bars to show the rests value
- Label each unit fraction and draw the musical note to match

<i>Whole note</i>							
<i>Half note</i>				<i>Half note</i>			
<i>half note</i>				<i>Half rest</i>			
<i>Quarter note</i>		<i>Quarter note</i>		<i>Quarter note</i>		<i>Quarter note</i>	
<i>Eighth note</i>	<i>Eighth note</i>	<i>Eighth note</i>	<i>Eighth note</i>	<i>Eighth note</i>	<i>Eighth note</i>	<i>Eighth note</i>	<i>Eighth note</i>

Discussion questions with your partner using your chart:

1. How many half notes do you need to make a whole beat? _____
2. How many quarter notes do you need to make a whole beat? _____
3. How many eighth notes do you need to make a whole beat? _____
4. If you have 1 half note, how many quarter notes equal another half beat? _____
 - a. Why are a half note and 2 quarter notes the same?

5. If you have 2 quarter notes, how many eighth notes will equal 2 quarter notes? _____
6. What will 2 quarter notes and 4 eighth notes equal? _____

Name: _____

7. If you have 1 half note, how many eighth notes will equal another half note?

a. What will 1 half note and 4 eighth notes equal? _____



8. If you have 1 half note and 1 quarter note, how many eighth notes do you need to make a whole beat? _____ Why?

Name: _____

Part 2: Parts of a Whole

Fill in the chart to show how many beats there are in 1 whole note. Create a record the information in the table provided.

- **Example:** There are sixteen sixteenth notes in one beat.
- Show your work in the table.

Name	Note	⁴ 1 (4) measure in a bar	Number of notes in 1 beat
Sixteenth			16

Musical Notes Chart- OL

Name	Notes	⁴ 1 (4) measure in a bar <small>*draw what your notes will look like in your bar*</small>	Number of notes ⁴ in 1 (4) bar
Half notes			
Quarter Note			
Eighth Note			
Half note and quarter notes			
2 quarter notes and eighth notes			

Name: _____

Part 3: Music Dilemma

The conductor left his glasses at home and wants you to tell him how many beats are in this sheet of music. Analyze the music to determine how many beats there are in each bar, so it equals one whole beat, by adding or taking away any notes that do not belong. Fix any bars that are not equal to one whole beat. Explain your thinking using numbers or words below the music.

The image shows four staves of musical notation in 4/4 time. Each staff contains four bars of music. The notes and rests are as follows:

- Staff 1:**
 - Bar 1: Quarter note (G4), Quarter note (A4)
 - Bar 2: Quarter note (B4), Quarter note (C5), Quarter note (B4), Quarter note (A4)
 - Bar 3: Quarter note (G4), Quarter note (F4), Quarter note (E4), Quarter note (D4)
 - Bar 4: Quarter note (C4), Quarter note (B3), Quarter note (A3), Quarter note (G3)
- Staff 2:**
 - Bar 1: Quarter note (G4), Quarter note (A4), Quarter note (B4), Quarter note (C5)
 - Bar 2: Quarter note (B4), Quarter note (A4), Quarter note (G4), Quarter note (F4)
 - Bar 3: Quarter note (E4), Quarter note (D4), Quarter note (C4), Quarter note (B3)
 - Bar 4: Quarter note (A3), Quarter note (G3), Quarter note (F3), Quarter note (E3)
- Staff 3:**
 - Bar 1: Quarter note (G4), Quarter note (A4), Quarter note (B4), Quarter note (C5)
 - Bar 2: Quarter note (B4), Quarter note (A4), Quarter note (G4), Quarter note (F4)
 - Bar 3: Quarter note (E4), Quarter note (D4), Quarter note (C4), Quarter note (B3)
 - Bar 4: Quarter note (A3), Quarter note (G3), Quarter note (F3), Quarter note (E3)
- Staff 4:**
 - Bar 1: Quarter note (G4), Quarter note (A4), Quarter note (B4), Quarter note (C5)
 - Bar 2: Quarter note (B4), Quarter note (A4), Quarter note (G4), Quarter note (F4)
 - Bar 3: Quarter note (E4), Quarter note (D4), Quarter note (C4), Quarter note (B3)
 - Bar 4: Quarter note (A3), Quarter note (G3), Quarter note (F3), Quarter note (E3)

Name: _____

Part 4: Music Composition

- The Boston Pops want you to provide 20 bars of music, using 4 of the 8 notes and rests throughout the 20 scales.
- Remember, each bar must equal $1\left(\frac{4}{4}\right)$ whole beat.
- If you want, you can create lyrics to go with your music!



$1/4 + 1/4 + 1/4 + 1/4 = 4/4$ $1/8 + 1/8 + 1/4 + 1/4 = 4/4$




Name: _____

Extension: Composition Story Problems

The Boston Pops want to find two equivalent fractions for $\frac{1}{2}$ using the notes from your music. Draw a picture or number line below to show how you found your answer.

The Boston Pops conductor thinks $\frac{2}{8}$ is bigger than $\frac{2}{4}$, but you keep telling him $\frac{2}{4}$ is bigger. Who is correct? Draw a picture or number line to show your thinking.

You are trying to read your new music. You think the bar shows two eighth notes and two quarter notes. Will this make a whole ($\frac{4}{4}$) beat? Explain your thinking using words or pictures. ***hint, use your first chart to help!***

The pianist drew the following note  on her sheet of music. She wanted to show the note another way. Her friend, the cellist, told her to draw 3 eighth notes. Is the cellist correct? Why or why not? Explain your thinking using pictures or words.



Are you a composer? Rubric

	Exceeds	Meets	Not Yet
<p>Math Concept: Numerator & Denominator 3.NF.1: Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.</p>	<p>I understand the basic concept numerator/denominator as parts of a whole and am able to apply my understanding to solve problems and create something new.</p>	<p>I understand the basic concept of numerator/denominator as parts of a whole.</p>	<p>I still need to work on:</p>
<p>Math Concept: Simple Equivalent Fractions 3.NF.3: Explain equivalence of fractions.</p> <ul style="list-style-type: none"> ● 3.NF.3a: Represent two fractions as equivalent (equal) if they are the same size ● 3.NF.3B: Recognize and generate simple equivalent fractions. Explain why the fractions are equivalent. 	<p>I can show that finding equivalent fractions is important when adding or subtracting fractions as part of a whole.</p>	<p>I am able to show the equivalence of fractions in special cases.</p> <ul style="list-style-type: none"> ● I can represent two fractions as equal if they are the same size. ● I recognize and generate simple equivalent fractions. I can explain why they are equivalent. 	<p>I still need to work on:</p>
<p>Critical Thinking</p>	<p>I am able to apply my understanding of math concepts in music to solve problems and/or create something new.</p>	<p>I understand how math concepts apply to music.</p>	<p>I still need to work on:</p>



MCIEA Rubric Guiding Principles

The following outlines the MCIEA way of thinking about rubric design. While MCIEA shared rubrics will generally be designed with the following principles in mind, you may decide to design your locally developed rubrics in a different way. We share the following details to both guide you in understanding the format and coherence behind MCIEA shared rubrics as well as to share our current understanding of best practices for the design of high-quality rubrics.

- **Task Neutral** - MCIEA rubrics will be aligned to learning goals (competencies, standards, high-leverage skills, learning targets), rather than aligned to the task. This means that the items that go into the leftmost column are a description of what you want students to understand and be able to do, rather than a description of different elements of the task. Rubrics designed in alignment to tasks tend to read like student directions, rather than a tool for assessment and feedback. Anything you want students to do can be added to student directions as a checklist. Further, task neutral rubrics can be used across multiple tasks, meaning that teachers are not designing rubrics every time they create a new task and, more importantly, students develop metacognition around the idea that they are building a consistent set of high-leverage skills and understandings across multiple learning experiences.
- **Selection of Learning Goals** - These are important considerations when selecting items for the leftmost column. The principles below may lead teachers to combine groups of smaller standards (sometimes called power standards).
 - **Appropriate Type** - Rubrics are the opportunity to highlight the most high-leverage learning goals. The goals should be important enough to be built over time and applied/transferred to new contexts.
 - **Appropriate Number** - Brain science tells us that students can reasonably focus on between 2-5 high-leverage learning targets at a time. Said another way, just because an assessment can assess something, doesn't mean it has to.
 - **Grain Size** - Also known as the "Goldilocks Principle", learning goals should not be so broad that students have little information on what they are trying to do, but should not be so narrow that they form a checklist. Additionally, items should all be of a similar grain size, so that you avoid having something as important as critical thinking take up as much space (in student's minds) as something like neatness.
- **Performance Levels** - Our rubrics are designed with 3 performance levels (Exceeds, Meets, Not Yet). We place them in that order from left-to-right to put the highest performance level in student's view first. The following list is in the order which we suggest you develop rubrics. We find that many bad practices develop when performance levels are designed to produce scores consistent with traditional grading systems.
 - **Meets** - The student has satisfactorily demonstrated that they are on level in this learning goal.
 - **Exceeds** - There are many ways to approach the development of this category, the important consideration is that you decide on a coherent system for developing your exceeds category and apply it consistently. For MCIEA, we tend to look at the deepening of the skill or understanding in the following grade level and design our exceeds category from there.
 - **Not Yet** - We do not include an approaching category as teachers tend to spend undue time agonizing over what this level means, often only to find that it wasn't very meaningful when they get student work back. Rather we invite teachers to leave space in the Not Yet category for written feedback. As a rule, when the performance level increases, the skill or understanding gets more nuanced, rather than there just being more of the previous level. We avoid entirely the language of *never*, *sometimes*, *all the time*.