

ARTS IMPACT LESSON PLAN

Dance and Math Infused Lesson

Lesson Three: Fraction Problem Dances

Author: Debbie Gilbert Grade Level: Fifth



Enduring Understanding

Adding and subtracting fractions can reveal the part necessary to complete the whole.

Lesson Description (Use for family communication and displaying student art)

In this math and dance lesson, students consider how choreographers use fractions to invent their dances. They explore making sharp body percussion sounds and smooth movements. They solve the following word problem and use it to create small group dances: The choreographer has been asked to create a dance for the dance company. The dance will have a pattern that is a total of 10 counts long. The pattern will have two parts: sharp and smooth. The sharp body percussion part is $\frac{2}{5}$ th of the pattern. How many counts is the sharp body percussion part? How many counts is the smooth full-body movement part?

Learning Targets and Assessment Criteria

Target: Solves a fraction word problem.

Criteria: Finds the number of counts of sharp movements and the number of counts of smooth movements, given a total number of counts of 10, and sharp movements that are $\frac{2}{5}$ of the total number of counts.

Target: Choreographs a dance based on a word problem.

Criteria: Creates a movement sequence with a total of 10 counts with $\frac{2}{5}$ of the counts as sharp body percussion and $\frac{3}{5}$ of the counts as smooth full-body movement. Repeats the sequence.

Vocabulary	Materials	<u>Learning Standards</u>
Arts Infused: Pattern Math: Addition Fractions Subtraction Arts: Body percussion Choreographer Contrast Energy Movement Sharp Smooth	<u>Museum Artworks or Performance</u> Seattle, WA Pacific Northwest Ballet UW World Series of Dance Tacoma, WA Broadway Center for the Performing Arts Materials Math Dances CD by Debbie Gilbert; CD player; Computer with internet connection and projector; White board, document camera, or chart paper & markers; 8.5x11" white copy paper: copy Fraction Problem Dances Choreographer's Worksheet, one per student; Writing pencils; Class Assessment Worksheet continued	WA Arts Learning Standards For the full description of each anchor standard and the grade level performance standards, see: https://www.k12.wa.us/student-success/resources-subject-area/arts/arts-k-12-learning-standards Anchor Standard 1: Generate and conceptualize artistic ideas and work. Performance Standard (DA:Cr1.1.5): a. Build content for choreography using several stimuli (for example, music/sound, text, objects, images, notation, observed dance, experiences, literary forms, natural phenomena, current news, social events). Anchor Standard 4: Select, analyze, and interpret artistic work for presentation. Performance Standard (DA:Pr4.1.5): b. Dance to a variety of rhythms generated from internal and external sources. Perform movement phrases that show the ability to respond to changes in time. Anchor Standard 5: Develop and refine artistic techniques and work for presentation. Performance Standard (DA:Pr5.1.5): c. Collaborate with peer ensemble members to repeat sequences, synchronize actions, and refine spatial relationships to improve performance quality. Apply feedback from others to establish personal performance goals.

Common Core State Standards (CCSS) in Math

For a full description of CCSS Standards by grade level see: <http://www.k12.wa.us/CoreStandards/Mathematics/default.aspx>
5.NF. Use equivalent fractions as a strategy to add and subtract fractions.

5.NF.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using equations to represent the problem.

CCSS Mathematical Practices

MP.1. Make sense of problems & persevere in solving them.

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

Video

Urban Bush Women BOLD: 2010 Summer Leadership Institute Culminating Performance excerpt

http://www.youtube.com/watch?v=2eOmIx_dC8g

Soledad Barrio & Noche Flamenca

<http://www.youtube.com/watch?v=OSUmgBcofIE&list=UUjUbO8PDLWwuhnXKgbmqZ6Q>

The Moroccan Project, excerpt, Alonzo King LINES Ballet

http://www.youtube.com/watch?v=n5NcPI4_pvoU



Pacific Northwest Ballet images: Noelani Pantastico in Jean Christophe Maillot's *Roméo et Juliette*



Company Dancers in George Balanchine's *Serenade*, Choreography ©The George Balanchine Trust



James Moore and Choreographer Marcko Goeke in rehearsal for *Place a Chill*
© Angela Sterling

ICON KEY:

 = Indicates note or reminder for teacher

 = Embedded assessment points in the lesson

Pre-Teach

Practice the Math BrainDance, see lesson step 3. Explore adding and subtracting with fractions.

Lesson Steps Outline

Day One

1. Introduce solving a fraction word problem to plan the choreography of a dance using smooth and sharp energy. Analyze photographs or video of professional dancers using the two types of energy.

2. Remind students about agreements for appropriate dance behavior.

3. Lead students in Math BrainDance warm-up.

Music: "Math BrainDance (Fifth Grade)" #6, Math Dances by Debbie Gilbert

4. Guide exploration of sharp body percussion and smooth full-body movement.

Music: No accompaniment for the body percussion, "Smooth Cinquain" #15, Math Dances by Debbie Gilbert

 Criteria-based process assessment: Makes patterns of body percussion movements. Moves smoothly using the whole body.

5. Read the word problem and discuss strategies for solving it. Distribute worksheets and pencils. Ask students to solve the problem on their worksheets.

 Criteria-based teacher checklist, self-assessment: Finds the number of counts of sharp movements and the number of counts of smooth movements, given a total number of counts of 10, and sharp movements that are $\frac{2}{5}$ of the total number of counts.

6. Demonstrate creating a Fraction Pattern Dance.

Music: "Fraction Pattern Dance" #16, Math Dances by Debbie Gilbert

7. Guide students as they create Fraction Pattern Dances in small groups of 4-5.

Music: "Fraction Pattern Dance" #16, Math Dances by Debbie Gilbert

 Criteria-based teacher checklist: Creates a movement sequence with a total of 10 counts with $\frac{2}{5}$ of the counts as sharp body percussion and $\frac{3}{5}$ of the counts as smooth full-body movement. Repeats the sequence.

8. Lead reflection.

 Criteria-based self-assessment and reflection: Finds the number of counts of sharp movements and the number of counts of smooth movements, given a total number of counts of 10, and sharp movements that are $\frac{2}{5}$ of the total number of counts. Makes a connection between dance and math.

Day Two

1. Prepare students for rehearsing their dances. Review the word problem.

- Dancing Mathematicians, today we will focus on our Fraction Pattern Dances.
- I'll read the word problem that we used to create our dances: The choreographer has been asked to create a dance for the dance company. The dance will have a pattern that is a total of 10 counts long. The pattern will have two parts: sharp and smooth. The sharp body percussion part is $\frac{2}{5}$ th of the pattern. How many counts is the sharp body percussion part? How many counts is the smooth full-body movement part?
- What did you discover when you solved the choreographer's problem? How many counts is the sharp body percussion part? How many counts is the smooth full-body movement part?
- Could you use the same process to solve other word problems? Let's test that idea. Try this: The choreographer wants to invent a dance that is 12 counts long. It will have shaking movement and swinging movement. The shaking movement is $\frac{3}{4}$ of the dance. How many counts is the shaking movement? How many counts is the swinging movement? Let's do an instant hand dance to try out our solution.
- Dancing Mathematicians, today after we warm up with the BrainDance, we'll refine, rehearse, and perform our Fractions Pattern Dances with the 10-count pattern.

2. Remind students about agreements for appropriate dance behavior.

- Remind me, how can you be creative and safe at the same time?

3. Lead students in Math BrainDance from Day One.

- The BrainDance will warm up your body and make your brain work better at the same time. Notice when we use fractions in the BrainDance.

4. Support students as they refine and rehearse their Fraction Pattern Dances.

Music: "Fraction Pattern Dance" #16, Math Dances by Debbie Gilbert

- Review your sharp body percussion and your full-body smooth movements.
- Ask yourself, are your body percussion movements as sharp as you can possibly make them?
- Are you moving your whole body as smoothly as possible?
- Think about your formation (which is another way dancers use math). Will you begin in a circle, a line, a clump, or scattered?
- Practice beginning in a shape, repeating your two-part pattern four times, and ending in a shape.
- Practice the dance with music several times.

Criteria-based teacher checklist, self-assessment: Creates a movement sequence with a total of 10 counts with $\frac{2}{5}$ of the counts as sharp body percussion and $\frac{3}{5}$ of the counts as smooth full-body movement. Repeats the sequence.

5. Facilitate performance of Fraction Pattern Dances and response. Review performer and audience expectations.



[Audience and Performer Expectations](#)

- What do the performers want from their audience? What does the audience want from the performers?
- Each group will perform its dance. Audience, I'll ask you to describe the body percussion and smooth movements that you observed. What fraction of the pattern was body percussion and what fraction was smooth?

Criteria-based teacher checklist, peer assessment: Creates a movement sequence with a total of 10 counts with $\frac{2}{5}$ of the counts as sharp body percussion and $\frac{3}{5}$ of the counts as smooth full-body movement. Repeats the sequence.

6. Lead reflection.

- Dancing Mathematicians, what have you discovered by doing dance and math at the same time? How can that help you when you do fractions in math?

Criteria-based reflection: Makes a connection between dance and math.

Fraction Problem Dances Choreographer's Worksheet

Name: _____

Date: _____

The choreographer has been asked to create a dance for the dance company. The dance will have a pattern that is a total of 10 counts long. The pattern will have two parts: sharp and smooth. The sharp body percussion part is $\frac{2}{5}$ of the pattern.

How many counts is the sharp body percussion part?
How many counts is the smooth full-body movement part?

You may show your work here:

The sharp body percussion part is _____ counts.

The smooth full-body movement part is _____ counts.

ARTS IMPACT LESSON PLAN Dance and Math Infusion

Fifth Grade Lesson Three: Fraction Problem Dances

Teachers may choose to use or adapt the following self-assessment tool.

STUDENT SELF-ASSESSMENT WORKSHEET

Disciplines	MATH		DANCE/MATH				Total 6
Concept	Fractions		Fractions				
Criteria	Finds the number of counts of sharp movements and the number of counts of smooth movements, given a total number of counts of 10, and sharp movements that are $\frac{2}{5}$ of the total number of counts.		Creates a movement sequence with a total of 10 counts with $\frac{2}{5}$ of the counts as sharp body percussion and $\frac{3}{5}$ of the counts as smooth full-body movement. Repeats the sequence.				
Student Name	Sharp	Smooth	10 counts total	$\frac{2}{5}$ sharp	$\frac{3}{5}$ smooth	Repeats	

ARTS IMPACT LESSON PLAN Dance and Math Infusion

Fifth Grade Lesson Three: Fraction Problem Dances

CLASS ASSESSMENT WORKSHEET

Disciplines	MATH		DANCE/MATH				Total 6
Concept	Fractions		Fractions				
Criteria	Finds the number of counts of sharp movements and the number of counts of smooth movements, given a total number of counts of 10, and sharp movements that are 2/5 of the total number of counts.		Creates a movement sequence with a total of 10 counts with 2/5 of the counts as sharp body percussion and 3/5 of the counts as smooth full-body movement. Repeats the sequence.				
Student Name	Sharp	Smooth	10 counts total	2/5 sharp	3/5 smooth	Repeats	
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
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18.							
19.							
20.							
21.							
22.							
23.							
24.							
25.							
26.							
27.							
28.							
29.							
30.							
Total							
Percentage							

What was effective in the lesson? Why?

What do I want to consider for the next time I teach this lesson? What were the strongest connections between dance and math?

Teacher: _____

Date: _____

ARTS IMPACT FAMILY LETTER

DANCE AND MATH LESSON: Fraction Problem Dances

Dear Family:

Today your child participated in an **Arts and Math** lesson. We talked about how both mathematicians and dancers can add or subtract fractions to choreograph or invent a dance.

- We did the Math BrainDance to warm up our brains and bodies.
- We explored making sharp body percussion like clapping, tapping, snapping, and stomping. We also made smooth movements with our full bodies.
- We solved this word problem: The choreographer has been asked to create a dance for the dance company. The dance will have a pattern that is a total of 10 counts long. The pattern will have two parts: sharp and smooth. The sharp body percussion part is $\frac{2}{5}$ th of the pattern. How many counts is the sharp body percussion part? How many counts is the smooth full-body movement part?
- We invented and performed a dance that solved the word problem.
- We discussed how using fractions in dance helps us when we work with fractions in math.

At home, you could sing a song and figure out what fraction of the song is the chorus and what fraction is the verse. Ask your child to show you how to use fractions to make a dance.

Enduring Understanding

Adding and subtracting fractions can reveal the part necessary to complete the whole.