

ARTS IMPACT LESSON PLAN

Dance and Math Infused Lesson

Lesson One: *Place Value Moves*

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Enduring Understanding

Movements and numbers can represent place value in a numeral.

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

In this math and dance lesson, students consider place value. They explore how they can move while counting by ones, tens, and hundreds, and freeze in a shape using their whole bodies. In trios, they write a three-digit number and make a dance representation of the number using big, medium, or small size movement and place in space. Each dancer creates a movement and repeats it to match a number in the ones, tens, or hundreds place. They perform and audience members identify the number.

Learning Targets and Assessment Criteria

Target: Represents place value in a three-digit number with movement.

Criteria: Repeats movements that match the numbers in the ones, tens, or hundreds place.

Target: Writes a three-digit number that describes the place value dance.

Criteria: Notates the digits in the ones, tens, and hundreds place that match the number of repetitions in the dance.

Vocabulary	Materials	Learning Standards
<p><u>Arts Infused:</u> Count Size</p> <p><u>Math:</u> Place Value</p> <p><u>Arts:</u> Movement Self-space Shape Space Bubble</p>	<p>Museum Artworks or Performance:</p> <p>Seattle, WA Pacific Northwest Ballet UW World Series of Dance</p> <p>Tacoma, WA Broadway Center for the Performing Arts</p> <p>Materials <i>Math Dances</i> CD by Debbie Gilbert; <i>Music for Creative Dance, Volume IV</i>, by Eric Chappelle; CD player; White board or chart paper & markers; Paper; Writing pencils; Drum/percussion instrument; Class Assessment Worksheet</p> <p align="right"><i>continued</i></p>	<p>WA Arts State Grade Level Expectations <i>For the full description of each WA State Arts Grade Level Expectation, see: http://www.k12.wa.us/Arts/Standards</i></p> <p>1.1.1 Elements: Shape, Space 1.2.1 Skills and Techniques: Non-locomotor Movements 1.4.1 Audience Skills 2.1.1 Creative Process 2.2.1 Performance Process 2.3.1 Responding Process 4.2.1 Connection between Dance and Math</p> <p>Early Learning Guidelines (Pre-K – Grade 3) <i>For a full description of Washington State Early Learning and Child Development Guidelines see: http://www.del.wa.gov/development/guidelines/ (2nd grade) 6. Learning about my world: Math: understand place value in three-digit numbers. Arts: try different types of movement and dance; pay attention to performances, and describe them to others.</i></p> <p>Common Core State Standards (CCSS) in Math http://www.k12.wa.us/CoreStandards/Mathematics/default.aspx 2.NBT. Understand place value. 2.NBT.1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones.</p> <p>CCSS Mathematical Practices MP.2. Reason abstractly and quantitatively. MP.4. Model with mathematics. MP.6. Attend to precision.</p>

Pacific Northwest Ballet images:
PNB dancers in Jerome Robbins'
Fancy Free.



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ICON KEY:

 = Indicates note or reminder for teacher

 = Embedded assessment points in the lesson

Pre-Teach

Practice the Math BrainDance, see lesson step 3. Unpack the math concepts in the BrainDance. Explore place value. Practice counting and bundling groups of tens and hundreds with cubes.

Lesson Steps Outline

1. Introduce dancing place value. Analyze photo of dancers showing place value.

2. Prepare students for dancing by creating agreements for appropriate dance behavior. Chart student responses.

3. Lead students in *Math BrainDance* warm-up.

Music: "Math BrainDance (Second Grade)" #3, *Math Dances* by Debbie Gilbert

4. Guide an exploration moving the whole body with small, medium, and big movements in self-space and freezing in a shape. Use a drum for accompaniment.

 Criteria-based process assessment: Performs small, medium, and big movements in self-space. Freezes in shapes.

5. Demonstrate dancing place value with two volunteers.

Music: "Up and At 'Em" #11, *Music for Creative Dance, Volume IV*, by Eric Chappelle

6. Assist students as they dance the place value of numbers in small groups.

Divide class into groups of three. Distribute a paper and pencil to each group to write its number.

 Criteria-based teacher checklist, self-assessment: Repeats movements that match the numbers in the ones, tens, or hundreds place. Notates the digits in the ones, tens, and hundreds place that match the number of repetitions in the dance.

7. Facilitate performance of place value dances and response. Discuss performer and audience behavior.

Criteria-based teacher checklist, peer assessment: Repeats movements that match the numbers in the ones, tens, or hundreds place. Notates the digits in the ones, tens, and hundreds place that match the number of repetitions in the dance.

8. Guide class reflection connecting dance and math.

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

LESSON STEPS

- ▣ Prepare the classroom for dance.



Moving Desks/Set-up

1. Introduce dancing place value. Analyze photo of dancers showing place value.

- *Today, we are going to be dancing and doing math at the same time.*
- *Dancing Mathematicians are curious and look for answers. They can use movements with their bodies to figure out why something is true in math.*
- *We'll be Dancing Mathematicians and we'll be dancing about place value.*
- *What do you know about place value?*
- *Can I have a volunteer write a three-digit number on the board?*
- *Which number is in the ones place? The tens place? The hundreds place?*

▣ You may use this photo: Pacific Northwest Ballet dancers in Jerome Robbins' *Fancy Free*. You could also choose to find your own photos or videos that represent a variety of styles and cultures that illustrate dancers in a line with big, medium, and then small shapes. You could review, for example, The UW World Dance Series, <http://uwworldseries.org/world-dance>.



- *Let's look at this picture of three dancers. It looks to me as if one dancer is in the hundreds place. One dancer is in the tens place and One dancer is in the ones place. Which dancer is in the ones place? The tens place? The hundreds place? How do you know?*
- *Does the position help you figure it out? What about the size of their shapes?*

2. Prepare students for dancing by creating agreements for appropriate dance behavior. Chart student responses.

- *How can you be creative and safe at the same time?*



3. Lead students in *Math BrainDance* warm-up. (BrainDance originally developed by Anne Green Gilbert, www.creativedance.org, reference: *Brain-Compatible Dance Education*, video: *BrainDance, Variations for Infants through Seniors*.)
Music: "Math BrainDance (Second Grade)" #3, *Math Dances* by Debbie Gilbert



- *Let's warm-up your brains and bodies with the BrainDance! Notice the numbers in the BrainDance.*

Breath

- *Dancing Mathematicians, breathe calmly.*



Tactile

- *Tap from the top of your head all the way to your toes. We'll count by fives to eighty: 5, 10, 15 ... 80.*

Core-Distal

- *Grow into a huge quadrilateral shape and shrink into a small shape.*

Head-Tail

- *Curl your backbone forwards and backwards and from side to side. We'll count by tens starting at fifty and go to one hundred twenty: 50, 60, 70 ... 120.*

Upper Half

- *Smoothly move the whole top of your body while the lower half freezes. Draw giant three-digit numbers with your arms.*

Lower Half

- *Smoothly move the whole lower half of your body while the upper half freezes. Draw giant three-digit numbers with your legs.*

Body-Half Right

- *Move sharply with the right side of your body while the left side is frozen. Draw a huge triangle, a quadrilateral, a pentagon, and a hexagon.*

Body-Half Left

- *Move sharply with the left side of your body while the right side is frozen. Draw a huge triangle, a quadrilateral, a pentagon, and a hexagon.*

Eye-Tracking:

- *Focus on your right thumb. Move it from one side to the other and up and down. Watch your left thumb moving from side to side and up and down.*

Cross-Lateral

- *Reach across your body up high, up high, down low, down low. We'll count by 100's starting at 100 and go to 1,600: 100, 200, 300 ... 1,600.*

Vestibular

- Turn, then freeze in a triangle shape. Turn, then freeze in a quadrilateral shape. Turn, then freeze in a pentagon shape. Turn, then freeze in a hexagon shape.

Breath:

- Breathe calmly, *Dancing Mathematicians*.

4. Guide an exploration moving the whole body with small, medium, and big movements in **self-space** and freezing in a **shape**. Use a drum for accompaniment.



Prompting for Creativity

- Put on a **space bubble** so you won't touch anyone.
- We are going to do different movements in self-space. That means you will stay on one spot. Use your whole body when you move — your head, your arms, your legs, and your back!
- We'll move ten times and then freeze in a shape, like a statue. Count out loud when you move. When you freeze, it is OK to breathe and to blink.
- Let's move small and count by ones. Bend: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Freeze.
- Small twist: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Freeze.
- Let's count by 10's this time and move at a medium size. Draw curved lines in the air with your elbows: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100. Freeze.
- Draw straight lines in the air with your knees. Make your movements medium-sized: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100. Freeze.
- Let's count by 100's this time and move really big. Wiggle: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000. Freeze.
- Big stretches: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000. Freeze.

Criteria-based process assessment: Performs small, medium, and big movements in self-space. Freezes in shapes.

5. Demonstrate dancing place value with two volunteers.

Music: "Up and At 'Em" #11, *Music for Creative Dance, Volume IV*, by Eric Chappelle



Place Value
Dance with Trios

- My assistants and I will dance a number for you. We'll stand in a line and be facing you as we dance. So from the audience, you will see the dancer on the right is in the ones place. The dancer in the middle is in the tens place. The dancer on the left is in the hundreds place.
- I am going to write a three-digit number on the board, e.g. 357. I could also use expanded notation and write it like this: $300 + 50 + 7$.
- Each dancer will do a movement to do in one spot, counting out loud as he/she moves the appropriate number of times, and then freezes.

- *Since the tens place is a bigger value, but not as big as the hundreds place, the movements will be medium-sized and you can count by tens in a classroom conversation voice.*
- *Since the hundreds is a larger value, the movements will be big and you can count in a teacher voice.*
- *Assistants, let's choose a movement for our dance (e.g. reach).*
- *First, the hundreds place dancer will count in a teacher voice and do big reaches: 100, 200, 300. Freeze.*
- *Next, the tens place dancer will count in a conversation voice and do medium reaches: 10, 20, 30, 40, 50. Freeze.*
- *Finally, the ones place dancer will count in a whisper and do small reaches: 1, 2, 3, 4, 5, 6, 7. Freeze.*
- *What number did we dance? 357. How do you know that's true?*

6. Assist students as they dance the place value of numbers in small groups. Divide class into groups of three. Distribute a paper and pencil to each group to write its number.

Music: "Up and At 'Em" #11, *Music for Creative Dance, Volume IV*, by Eric Chappelle

▣ When assessing this criteria, because any students who are not meeting criteria will be very clear to you, you may want to use a reverse checklist, putting a "0" where students have not met criteria, rather than trying to notate every single one who has met criteria. You can go back later and give those who have met criteria a "1." This information will let you know what and who needs more practice, so you can return to it in the future. You can choose to use the checklist during rehearsal or wait until the performance.

- *In your group, write a three-digit number. Put your names on the paper, too.*
- *Decide who is in the ones place. From your point of view as a dancer you will be on the left in the line. From the audience's point of view you will be on the right. So when you dance your number, the audience will see it in the same order that they see a number written on paper or on the board.*
- *Decide who is in the tens place. You will be in the middle.*
- *Decide who is in the hundreds place. From your point of view as a dancer, you are on the right.*
- *Explore several different choices for self-space movements and choose just one. Hundreds are big. Tens are medium. Ones are small.*
- *Practice dancing your movements. First, the hundreds place dances and counts in a teacher voice by hundreds, then the tens place dances and counts in a conversation voice by tens, then the ones place dances and counts in a whisper by ones.*
- *Ask yourself, does the number you have written match the number of repetitions in your dance?*

☑ Criteria-based teacher checklist, self-assessment: Repeats movements that match the numbers in the ones, tens, or hundreds place. Notates the digits in the ones, tens, and hundreds place that match the number of repetitions in the dance.

7. Facilitate performance of place value dances and response. Discuss performer and audience behavior.



Performer and Audience
Expectations

- *Before we begin, what is the job of the audience? What is the job of the performers?*
- *Audience, after each performance, I'll ask you to describe the movement you saw and say the number they danced. I'll also ask you how you know that it is true. Then, the dancers will show you the number they have written on their paper.*

▣ Optional: the audience could use white boards to write the numbers they observe.

☑ Criteria-based teacher checklist, peer assessment: Repeats movements that match the numbers in the ones, tens, or hundreds place. Notates the digits in the ones, tens, and hundreds place that match the number of repetitions in the dance.

8. Guide class reflection connecting dance and math.

- *Dancing Mathematicians, today, you danced the place value of numbers. Turn and talk to someone close to you. What did you discover?*
- *The next time in math that you work with three-digit numbers remember how you created them with your whole bodies in movement.*

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

ARTS IMPACT LESSON PLAN Dance and Math Infusion

Second Grade Lesson One: *Place Value Moves*

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

STUDENT SELF-ASSESSMENT WORKSHEET

Disciplines	DANCE/MATH	MATH			Total 4
Concept	Movement Place Value	Place Value			
Criteria	Repeats movements that match the numbers in the ones, tens, or hundreds place.	Notates the digits in the ones, tens, and hundreds place that match the number of repetitions in the dance.			
Student Name		ones	tens	hundreds	

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CLASS ASSESSMENT WORKSHEET

Disciplines	DANCE/MATH	MATH			Total 4
Concept	Movement Place Value	Place Value			
Criteria	Repeats movements that match the numbers in the ones, tens, or hundreds place.	Notates the digits in the ones, tens, and hundreds place that match the number of repetitions in the dance.			
Student Name		ones	tens	hundreds	
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
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: _____

DANCE AND MATH LESSON: *Place Value Moves*

Dear Family:

Today your child participated in an **Arts and Math** lesson. We talked about how both mathematicians and dancers can communicate place value.

- We did the Math BrainDance to warm up our brains and bodies.
- We moved while counting by ones, tens, and hundreds, and froze in a shape using our whole bodies.
- We worked in a trio. We wrote a three-digit number and danced that number by creating a movement to match a number in the ones, tens, or hundreds place. For example, for 357, the hundreds place dancer did big reaches three times. The tens place dancer did medium reaches five times. The ones place dancer did small reaches seven times.
- We performed for each other and the audience identified each number.
- We talked about how dancing place value can help us understand it in math.

At home, you could write three-digit numbers and ask your child how to dance them.

Enduring Understanding

Movements and numbers can represent place value in a numeral.