

ARTS IMPACT LESSON PLAN

Dance and Math Infused Lesson

Lesson Two: *Greater Than, Less Than, and Equal To Dance*

Author: Debbie Gilbert Grade Level: First



Enduring Understanding

Numbers, movements, and objects can be compared using the terms: greater than, less than, and equal to, and the symbols: $>$, $<$, $=$.

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

In this math and dance lesson, students think about how the symbols: $>$, $<$, $=$ can be used to compare two numbers. They practice moving and counting simultaneously. They perform movements that correspond to a number, followed by a shape that shows the symbol that describes the comparison ($>$, $<$, $=$), and end with movements that correspond to a second number. In a trio, they write and dance a comparison.

Learning Targets and Assessment Criteria

Target: Dances a comparison.

Criteria: Repeats a movement to correspond with the first or second number in the comparison or makes a shape to show the symbol that compares the two numbers ($>$, $<$, or $=$).

Target: Records the results of a comparison.

Criteria: Writes a number, a symbol that shows the relationship between the numbers ($>$, $<$, or $=$), and another number.

Vocabulary	Materials	Learning Standards
<p><u>Arts Infused:</u> Compare Comparison</p> <p><u>Math:</u> Greater Than $>$ Less Than $<$ Equal To $=$</p> <p><u>Arts:</u> Movement <u>Shape</u></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; Math manipulatives; White board or chart paper & markers; Writing paper; Writing pencils; Drum/percussion instrument; Class Assessment Worksheet</p> <p><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: Space 1.2.1 Skills and Techniques: Non-locomotor Movements 1.4.1 Audience Skills <u>2.1.1 Creative Process</u> 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) For a full description of Washington State Early Learning and Child Development Guidelines see: http://www.del.wa.gov/development/guidelines/</p> <p>(1st grade) 3. Touching, seeing, hearing, and moving around: Using the large muscles (gross motor skills): develop skills for moving in place (non-locomotor), such as bending and twisting.</p> <p>(1st grade) 6. Learning about my world: Math: know and talk about different ways to solve math problems. Arts: create and respond to arts; become aware of skills needed to dance around the room.</p> <p><i>continued</i></p>

Pacific Northwest Ballet images:
Dancers in Jerome Robbins' *Dances at a Gathering* (two photos)



Company dancers in Victor Quijada's *Mating Theory*



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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>
1.NBT.3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.

CCSS Mathematical Practices

- MP.2. Reason abstractly and quantitatively.
- MP.4. Model with mathematics.
- MP.6. Attend to precision.

ICON KEY:

 = Indicates note or reminder for teacher

 = Embedded assessment points in the lesson

Pre-Teach

Practice the *Math BrainDance*, see lesson step 3. Review the symbols: $>$, $<$, $=$. Practice with math manipulatives.

Lesson Steps Outline

1. Introduce comparing with $>$, $<$, and $=$ in dance and math. Analyze photos of dancers showing comparisons.

2. Remind students about agreements for appropriate dance behavior.

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

Music: "Math BrainDance (First Grade)" #2, *Math Dances* by Debbie Gilbert

4. Guide students in moving while counting.

Music: "TV Dinner" #2, *Music for Creative Dance, Volume IV*, by Eric Chappelle

5. Direct students to explore making greater than, less than, and equal to symbols in a variety of ways. Draw the symbol on the board.

Criteria-based process assessment: Makes a shape to show the symbol that compares two numbers ($>$, $<$, or $=$).

6. Demonstrate and support students as they create a Greater Than, Less Than, or Equal To Dance in a trio.

Music: "TV Dinner" #2, *Music for Creative Dance, Volume IV*, by Eric Chappelle

Criteria-based teacher checklist, self-assessment: Repeats a movement to correspond with the first or second number in the comparison or makes a shape to show the symbol that compares the two numbers ($>$, $<$, or $=$). Writes a number, a symbol that shows the relationship between the numbers ($>$, $<$, or $=$), and another number.

7. Facilitate a performance of the Greater Than, Less Than, or Equal To Dances. Discuss performer and audience behavior.

Criteria-based teacher checklist, peer assessment: Repeats a movement to correspond with the first or second number in the comparison or makes a shape to show the symbol that compares the two numbers ($>$, $<$, or $=$). Writes a number, a symbol that shows the relationship between the numbers ($>$, $<$, or $=$), and another number.

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 comparing with $>$, $<$, and $=$ in dance and math. Analyze photos of dancers showing comparisons.

- *Today, we'll be dancing and doing math at the same time. We'll be Dancing Mathematicians! We will compare numbers of movements that are greater than, less than, or equal to other movements.*
- *Use your hands to make a greater than symbol, a less than symbol, and an equals sign.*

- ▣ Be aware that if you are standing in front of the class, what is a greater than symbol to you, if you make it with your hands, will be a less than symbol from the point of view of your students.

- *It helps me to remember how to use the greater and less than symbol by thinking that the "opening" of the symbol faces the larger number. It's like a hungry alligator that always eats the bigger number.*

- ▣ You may use these photos: Pacific Northwest Ballet: Dancers in Jerome Robbins' *Dances at a Gathering* (two photos) and Company dancers in Victor Quijada's *Mating Theory*. You could also choose to find your own photos of dancers demonstrating comparisons that represent a variety of styles and cultures. You could review, for example, The UW World Dance Series, <http://uwworldseries.org/world-dance>.





- Here are three photos of dancers from Pacific Northwest Ballet. In this picture, is the number of dancers on one side greater than, less than, or equal to the number of dancers on the other side? Make the symbol with your hands. How do you know it is true?

Repeat process with each photo.

- I am going to say two numbers. Then, we can decide if they are greater than, less than or equal to each other, and use our hands to show the right symbol: Four and two. Four is _____ (students make symbol) two. I'll draw it on the board: $4 > 2$.
- Let's compare six and eleven. Six is _____ (students make symbol) eleven. I'll write $6 < 11$.
- We'll be doing the same thing today using movement with our whole bodies.

2. Remind students about agreements for appropriate dance behavior.

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



Movement Safety

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 (First Grade)" #2, *Math Dances* by Debbie Gilbert

- Warm-up your brain and body with the BrainDance.



BrainDance by Artist Mentor

Breath

- *Dancing Mathematicians*, breathe softly.



BrainDance by Students

Tactile

- Tap from the top of your head all the way to your toes. We'll count by twos to forty:
2, 4, 6 ... 40.

Core-Distal

- Grow into a tall shape and shrink into a short shape.

Head-Tail

- *Use your whole body and curl your backbone forwards and backwards and from side to side. We'll count by tens starting at forty and go to one hundred twenty: 40, 50, 60 ... 120.*

Upper Half

- *Move an upper quarter of your body and freeze everything else. Move the other upper quarter. Now move the whole top half of your body while the lower half freezes.*

Lower Half

- *Move a lower quarter of your body and freeze everything else. Move the other lower quarter. Now move the whole lower half of your body while the upper half freezes.*

Body-Half Right

- *Do short and long movements with the right half of your body while the left half is frozen. We'll count backwards from 20 to 10: 20, 19, 18 ... 10.*

Body-Half Left

- *Do short and long movements with the left half of your body while the right half is frozen. We'll count backwards from 20 to 10: 20, 19, 18 ... 10.*

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 fives to eighty: 5, 10, 15 ... 80.*

Vestibular

- *Turn, then freeze in a tall shape. Turn, then freeze in a short shape. Turn, then freeze in a wide shape. Turn, then freeze in a narrow shape.*

Breath

- *Breathe softly, Dancing Mathematicians.*
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4. Guide students in moving while counting.

Music: "TV Dinner" #2, *Music for Creative Dance, Volume IV*, by Eric Chappelle

- *Let's move and count at the same time. Then we'll hold up our fingers to show the number of movements we did. Wiggle your hands eight times: one, two, three, four, five, six, seven, eight. Now show me eight with your fingers. Circle your arms five times: one, two, three, four, five. Show me five with your fingers.*

▣ Repeat with other movements, e.g. twist your whole body ten times, bend six times, and stretch twelve times.

▣ Discuss how to use your fingers to show numbers higher than ten.

5. Direct students to explore making greater than, less than, and equal to symbols in a variety of ways. Draw the symbol on the board.



Prompting for Creativity

- *Here's a greater than symbol.*
- *How many different ways can we use our body shapes to make a greater than symbol?*
- *Let's try some!*

▣ Spotlight different students who are using their whole bodies to show the symbol.

▣ Repeat with less than and equal to.



Criteria-based process assessment: Makes a shape to show the symbol that compares two numbers ($>$, $<$, or $=$).

6. Demonstrate and support students as they create a Greater Than, Less Than, or Equal To Dance in a trio.



Greater Than, Less Than, and Equal To Dance

Music: "TV Dinner" #2, *Music for Creative Dance, Volume IV*, by Eric Chappelle

- *I need two volunteer assistants to demonstrate a Greater Than, Less Than, or Equal To Dance. We'll pick two numbers (both less than 20). We'll decide if the first one is greater than, less than, or equal to the second number. Then, we'll write the comparison on a card with the symbol, for example $6 < 12$.*
- *Next, one of us will create a movement that will be repeated as she counts out loud up to six, for example, six reaches. She ends showing six fingers. The next student will make a shape to show the symbol, in this case a less than sign, and say "less than." Finally, the last dancer will count up as he repeats a movement twelve times, for example, twelve jumps, ending by showing twelve fingers. Then, we'll show the audience our comparison card.*

▣ As the groups rehearse, travel through the classroom, observing, asking questions, and offering assistance as needed. Encourage students to use their whole bodies, extending movements and shapes from the center of their bodies all the way to their fingers and toes.

▣ You can choose to do a preliminary assessment in pencil at this point and assess again when students perform.

- *Find two partners and pick up a card and a pencil.*
- *Choose two numbers, each less than 20.*

- Write the first number, the correct symbol, and the second number on your card. Write your names on the card.
- Pick a movement for each number.
- First dancer, count up as you do the movement the same number of times as the first number. Then show the number with your fingers.
- Second dancer, make a shape to show the symbol, and say the name of the symbol.
- Third dancer, count up as you do the movement the same number of times as the second number. Show the number with your fingers.
- Practice.
- Turn and talk with your trio: Does your dance match the comparison you have recorded on your card? How do you know it's true?

Criteria-based teacher checklist, self-assessment: Repeats a movement to correspond with the first or second number in the comparison or makes a shape to show the symbol that compares the two numbers ($>$, $<$, or $=$). Writes a number, a symbol that shows the relationship between the numbers ($>$, $<$, or $=$), and another number.

7. Facilitate a performance of the Greater Than, Less Than, or Equal To Dances. Discuss performer and audience behavior.



Performer and Audience Expectations

- I'd like everyone to see the Greater Than, Less Than, and Equal To Dances you have created.
- Before we begin, what is the job of the audience? What is the job of the performers?
- After each trio shows its dance, I'll ask the dancers to hold their last shapes and we'll say the comparison we see. Then they'll show us how they have written it on their card with numbers and a symbol.

Criteria-based teacher checklist, peer assessment: Repeats a movement to correspond with the first or second number in the comparison or makes a shape to show the symbol that compares the two numbers ($>$, $<$, or $=$). Writes a number, a symbol that shows the relationship between the numbers: $>$, $<$, or $=$, and another number.

8. Guide class reflection connecting dance and math.

- Dancing Mathematicians observe, ask questions, and look for answers. What did you see when you watched the dances? What movements did the dancers do? How did you know that their movement matched the numbers and the symbols on the cards? How did you know it was true?
- The next time in math that you decide if a number is greater than, less than, or equal to another number, remember how you did that with your whole bodies in movement.

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

ARTS IMPACT LESSON PLAN Dance and Math Infusion

First Grade Lesson Two: *Greater Than, Less Than, and Equal To Dance*

CLASS ASSESSMENT WORKSHEET

Disciplines	DANCE/MATH	MATH	Total
Concept	Movement, Shape, Comparison (>, <, or =)	Comparison (>, <, or =)	2
Criteria	Repeats a movement to correspond with the first or second number in the comparison, or makes a shape to show the symbol that compares the two numbers (>, <, or =).	Writes a number, a symbol that shows the relationship between the numbers (>, <, or =), and another number.	
Students			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
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16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
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: *Greater Than, Less Than, and Equal To Dance*

Dear Family:

Today your child participated in an **Arts and Math** lesson. We talked about how both mathematicians and dancers can compare numbers with symbols for greater than, less than, or equal to.

- We did the Math BrainDance to warm up our brains and bodies.
- We moved and counted at the same time.
- We made shapes with our bodies to show the greater than, less than, or equal to symbols.
- We wrote a comparison in a trio and then danced it. We made movements that matched the first number, followed by a shape that showed the symbol that described the comparison ($>$, $<$, $=$), and ended with movements that matched to a second number.

At home, you could make two groups of toys or books. Then decide if the first group is greater than, less than, or equal to the second group. Ask your child to show you how to do a Greater Than, Less Than, or Equal to Dance.

Enduring Understanding

Numbers, movements, and objects can be compared using the terms: greater than, less than, and equal to, and the symbols: $>$, $<$, $=$.