ARTS IMPACT LESSON PLAN

Dance and Math Infused Lesson

Lesson One: *Ratios in Jai Ho*
Author: Debbie Gilbert   Grade Level: Sixth Grade

Enduring Understanding
A ratio compares two numbers and describes the relationship between two quantities or two movements.

Lesson Description (Use for family communication and displaying student art)
In this dance and math lesson, students learn the opening dance sequence from Jai Ho, a dance seen in the Bollywood-style movie, Slumdog Millionaire. *They use their ratio reasoning to calculate the number of counts in the side lunge movement phrase by finding the missing value in a table that shows the relationship between the amount of arm flaps and the number of counts in the dance phrase. They take that missing value, which is 25% of the dance, and calculate the total number of counts in the opening sequence. Then, they check their work by doing the dance again while counting.*

Learning Targets and Assessment Criteria

Target: Learns a choreographed sequence.
　　Criteria: Performs the opening series of movements from the dance *Jai Ho*.

Target: Dances movement to represent the missing value in the following problem: If I do 2 arm flaps in a dance phrase that is 4 counts long, how long is the dance phrase when I do 12 arm flaps?
　　Criteria: Performs the side lunge movement phrase from *Jai Ho* for 24 counts.

Target: Dances a choreographed sequence in which 24 counts are 25% of the whole dance.
　　Criteria: Performs a 96-count series of movements.

Vocabulary	Materials	Learning Standards
Arts Infused:	**Museum Artworks or Performance**	**WA Arts Learning Standards in Dance**
Count		*For the full description of each standard, see:*
Part	**Seattle, WA**	*http://www.k12.wa.us/Arts/Standards*
Whole	Pacific Northwest Ballet	**Creating (Concepts: Space, Time, Energy.**
	UW World Series of Dance	**Skills: Extension, Flexion, Limb Rotation.)**
Math:		3. Refine and complete artistic work.
Percentage	**Tacoma, WA**	**Performing/Presenting/Producing**
Ratio	Broadway Center for the Performing Arts	4. Select, analyze, and interpret artistic work for
Value		presentation.
	Materials	5. Develop and refine artistic techniques and
Arts:	Computer and projector; table chart;	work for presentation.
Choreography	white board and markers, Class	**Responding**
Dance Phrase	Assessment Worksheet; music player	7. Perceive and analyze artistic work.
Movements		9. Apply criteria to evaluate artistic work.
	Music:	**Connecting**
	"Middle School BrainDance," *Middle*	10. Synthesize and relate knowledge and
	School Math Dances by Debbie Gilbert	personal experiences to make art.
	"Jai Ho", *Slumdog Millionaire (Music*	11. Relate artistic ideas and works with societal,
	from the Motion Picture)	cultural, and historical context to deepen
		understanding.
	Jai Ho Video link:	
	http://www.youtube.com/watch?v=xPvP	
	Uk96vb0	*continued*

Pre-Teach

Introduce ratio. Practice making tables of equivalent ratios and finding the missing values in the tables. Solve problems involving finding the whole, given a part and the percent. Set expectations for physical and emotional safety for dancing.

Lesson Steps Outline

1. Introduce using ratio reasoning to solve a dance problem.

2. Show video of the Bollywood-style dance, *Jai Ho*.

3. Define expectations for movement.

4. Lead students in the *Middle School BrainDance* warm-up.
Music: "Middle School BrainDance," *Middle School Math Dances* by Debbie Gilbert

5. Teach movements from the first part of *Jai Ho.*
Music: "Jai Ho", *Slumdog Millionaire (Music from the Motion Picture)*

☑ Criteria-based teacher checklist: Performs the opening series of movements from the dance *Jai Ho*.

6. Facilitate using a table with a missing value to calculate the total number of counts in one of the phrases from the dance.

☑ Criteria-based process assessment: Calculates the number of arm flaps when the dance phrase is sixteen counts long. Calculates number of counts in the side lunge dance phrase when twelve arm flaps are done. Calculates the number of arm flaps when the dance phrase is 108 counts long.

7. Guide students to calculate the total number of counts in the dance.

☑ Criteria-based process assessment: Calculates total number of counts when 24 counts are 25% of the dance.

8. Direct students to check their work by doing the dance while counting.

☑ Criteria-based teacher checklist, self-assessment: Performs the side lunge movement phrase from *Jai Ho* for 24 counts. Performs a 96-count series of movements.

9. Guide reflection.

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

LESSON STEPS_____

1. Introduce using ratio reasoning to solve a dance problem.

- *Today we are going to be infusing dance and math. As Dancing Mathematicians, we'll use movement to help us solve a math problem.*

- *We are going to learn part of a dance called Jai Ho that was inspired by the movie Slumdog Millionaire.*

- *Then we'll use ratio reasoning to find the missing value in a table that shows the number of counts in one dance phrase and use that value to calculate the total number of counts in the part of the dance we have learned.*

- *Finally, we'll check our math work by repeating the dance as we count.*

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2. Show video of the Bollywood-style dance, *Jai Ho*.
▤ There are many videos on YouTube that teach the dance. Note that they show a wide range of variations on the choreography. Search "how to do the Jai Ho dance" and choose the one that is most helpful to you. The link below shows the dance from the movie without instruction. (It may require removing safety mode to view.) There are also many performances of the dance on YouTube by students, flash mobs, and more.
Video link: http://www.youtube.com/watch?v=xPvPUk96vb0

- *This is the Jai Ho dance as it is done in the movie. We'll just be learning the first part of the dance.*

- *Describe what you see in the very first part of the dance.*

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3. Define expectations for movement.

- *When you are dancing, I expect you to be focused and to be respectful of each other and of yourself as a dancer.*

- *Keep empty space around yourself at all times and keep your eyes open and your body under control.*

- *Have fun and learn simultaneously!*

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4. Lead students in the *Middle School 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: "Middle School BrainDance," *Middle School Math Dances* by Debbie Gilbert

▤ In the BrainDance music, you will hear the title of each pattern spoken. The prompts below are suggestions if you would like to give the students more detail. You can also adapt the prompts to meet the needs of your students and the lesson. If you prefer to have the prompts spoken for you, you can use the "Middle School BrainDance with narration."

- *Before we start moving, we are going to do a BrainDance to warm-up our brains and bodies in preparation for learning the dance.*

- *The BrainDance will take us through a series of patterns that help to wire the central nervous system. The movement will increase oxygen and blood flow to your brain and body, and help with balance, alignment, and coordination.*

Breath
- *Dancing Mathematicians, breathe quietly.*

Tactile
- *Energize the surface of your body, tapping from your head to your toes.*

Core-Distal
- *Expand from your core into a large shape, reaching to the limits of your distal edges.*

- *Shrink into a small shape pulling everything back towards your core.*

Head-Tail
- *Curl your spine forwards and backwards and forwards and backwards.*

- *Curve from side to side.*

Upper Half
- *Freeze the lower half of your body. Move the upper half.*

Lower Half
- *Freeze the upper half of your body. Move the lower half.*

Body-Half Right
- *Dance with your whole right side while the left side is frozen.*

Body-Half Left
- *Dance with your whole left side while the right side is frozen.*

Cross-Lateral
- *Reach across your body with your arms on different levels.*

Vestibular
- *Turn. Freeze in a shape. Turn. Freeze in a shape. Turn. Freeze in a shape. Turn. Freeze in a shape.*

Breath
- *Breathe quietly, Dancing Mathematicians.*

5. Teach movements from the first part of _Jai Ho_.
Music: "Jai Ho", _Slumdog Millionaire (Music from the Motion Picture)_

▤ When assessing this criteria, any students who are not meeting criteria will be very clear to you, so 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 who needs more practice, so you can repeat the exploration in the future.

- _If you look online, you'll find lots of variations in this dance. I chose this one._

- _For the first four sets of eight counts (4 x 8 counts), just stand and feel the beat of the music in your legs._

- _For three sets of eight counts (3 x 8 counts): do a side lunge to the right with your hands on your hips, then two arm flaps. Repeat to the left. This move is done a total of six times._

- _For two sets of eight counts (2 x 8 counts): stroke your hair to the right, pull on your collar to the left. Repeat._

- _For one set of eight counts (1 x 8 counts): roll hands down, up, down, up._

- _For 1 x 8 counts punch over your head with right, then left hand._

- _For 1 x 8 counts: catch the butterfly (flap hands moving to the right, clap, flap hands moving to the left, clap)._

☑ Criteria-based teacher checklist: Performs the opening series of movements from the dance _Jai Ho_.

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6. Facilitate using a table with a missing value to calculate the total number of counts in one of the phrases from the dance.

- _We are going to focus on the side lunge dance phrase — the part of the dance where you lunge to the side and do two arm flaps._

- _Here is a table that shows the number of arm flaps in the dance and the number of counts in the side lunge dance phrase._

arm flaps	2	4	?	12	?
counts in dance phrase	4	8	16	?	108

- _I'll show you what it looks like when I do the dance phrase twice. I'll lunge right while counting "one, two", do two flaps while counting "three, four". I'll lunge left while counting "five, six", do two flaps while counting "seven, eight"._

- _Look back at the table, when I did two flaps, I had four counts in the phrase. When I had done four flaps, the phrase was eight counts long._

- *When the phrase is sixteen counts long, how many arm flaps will you do?*

- *How do you know?*

- *In the dance we do a total of twelve flaps. Use your ratio reasoning. How many counts is the side lunge dance phrase when twelve arm flaps are done?*

- *How do you know?*

- *What if we did the phrase for 108 counts; how many arm flaps would we have done?*

- *How do you know?*

☑ Criteria-based process assessment: Calculates the number of arm flaps when the dance phrase is sixteen counts long. Calculates number of counts in the side lunge dance phrase when twelve arm flaps are done. Calculates the number of arm flaps when the dance phrase is 108 counts long.

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7. Guide students to calculate the total number of counts in the dance.

- *Let's take the missing value from the table when we have done 12 arm flaps (24) and use it to help us calculate the total number of counts in the dance.*

- *If the 24 counts of the side lunge dance phrase are 25% of this part of the dance, how many counts total are in the first part of the dance?*

- *How do you know?*

☑ Criteria-based process assessment: Calculates total number of counts when 24 counts are 25% of the dance.

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8. Direct students to check their work by doing the dance while counting.

- *Let's check our work. We'll repeat the dance again and this time let's count while we are dancing. It will be easier to count the sets of eight and multiply, rather than count by ones.*

▤ Repeat the dance.

- *How many sets of eight did you get? How many counts total is that?*

- *Did our dance match our calculation? Why or why not?*

☑ Criteria-based teacher checklist, self-assessment: Performs the side lunge movement phrase from *Jai Ho* for 24 counts. Performs a 96-count series of movements.

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9. Guide reflection.

- *Dancing Mathematicians, what did you discover about ratio by dancing?*

- *The next time you work with ratio in math, remember how you used it with movement and it will help you understand.*

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

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

STUDENT SELF-ASSESSMENT WORKSHEET

Disciplines	DANCE	DANCE/MATH	DANCE/MATH	Total
Concept	**Movement Sequence**	**Movement Ratio**	**Movement Percentage**	3
Criteria Student Name	Performs the opening series of movements from the dance Jai Ho.	Performs the side lunge movement phrase from *Jai Ho* for 24 counts.	Performs a 96-count series of movements.	

CLASS ASSESSMENT WORKSHEET

Disciplines	DANCE	DANCE/MATH	DANCE/MATH	Total 3
Concept	**Movement Sequence**	**Movement Ratio**	**Movement Percentage**	
Criteria Student Name	Performs the opening series of movements from the dance Jai Ho.	Performs the side lunge movement phrase from *Jai Ho* for 24 counts.	Performs a 96-count series of movements.	
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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: *Ratios in Jai Ho*

Dear Family:

Today your child participated in an **Arts and Math** lesson. We talked about how dancers can use movement to solve a math problem about ratio.

- We learned the opening dance sequence from *Jai Ho*, a dance seen in the Bollywood-style move, *Slumdog Millionaire*.

- We used our ratio reasoning to calculate the number of counts in the side lunge movement phrase by finding the missing value in a table that shows the relationship between the number of arm flaps and the number of counts in the dance phrase.

- We took the missing value, which was 25% of the dance, and calculated the total number of counts in the opening sequence.

- We checked our work by doing the dance again while counting.

At home, you could watch or do dances and calculate the number of counts in the parts and the whole dance.

Enduring Understanding

A ratio compares two numbers and describes the relationship between two quantities or two movements.