ARTS IMPACT LESSON PLAN

Dance and Math Infused Lesson

Pattern

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Enduring Understanding

Repeating body movements and shapes can represent and extend patterns.

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

In this dance and math lesson, students create patterns. They explore big and small shapes and movements. Students alternate big and small shapes in an AB Pattern Circle. They create, perform, and use critical thinking to describe, analyze, and explain numerical patterns.

Learning Targets and Assessment Criteria

Target: Represents a pattern through math and dance.
Criteria: Creates a big or small shape to extend an AB repeating sequence.

Target: Creates a Numerical Pattern Dance.
Criteria: Chooses a movement and a rule. Repeats movement according to the rule.

Target: Thinks critically.
Criteria: Describes, analyzes, and explains numerical patterns.

Vocabulary

Arts Infused:
Pattern
AB Patterns

Arts:
General space
Movement
Repetition
Self-space
Shape
Size: big and small

Materials

Museum Artworks or Performance

Seattle, WA
Pacific Northwest Ballet
University of Washington World Series of Dance

Tacoma, WA
Broadway Center for the Performing Arts

Materials
Word of the day sign: pattern; Dance word sign for display: big and small size; Class Assessment Worksheet; Two percussion instruments; Music: *Music for Creative Dance, Contrast and Continuum, Volumes III and IV;* Music player

Learning Standards

WA Arts Learning Standards in Dance
For the full description of each standard, see:
http://www.k12.wa.us/Arts/Standards

Creating (Concepts: Size, Pattern)
1. Generate and conceptualize artistic ideas and work.
2. Organize and develop artistic ideas and work.

Performing/Presenting/Producing
4. Select, analyze, and interpret artistic work for presentation.
5. Develop and refine artistic techniques and work for presentation.

Responding
7. Perceive and analyze artistic work.
9. Apply criteria to evaluate artistic work.

Connecting
10. Synthesize and relate knowledge and personal experiences to make art.

Early Learning Guidelines (Pre-K – Grade 3)
For a full description of Washington State Early Learning and Child Development Guidelines see:
https://www.del.wa.gov/sites/default/files/imported/publications/development/docs/guidelines.pdf
(Age 4-5) 3. Touching, seeing, hearing and moving around: Using the large muscles (gross motor skills): move with purpose from one place to another using the whole body; show coordination & balance; enjoy challenging self to try new and increasingly difficult activities.
(Age 4-5) 6. Learning about my world: Math: compare size; create own patterns.

continued

Common Core State Standards (CCSS): Math
For a full description of CCSS Math Standards by grade level see:
http://www.k12.wa.us/CoreStandards/Mathematics/default.aspx
4.OA.5. Generate a number or shape pattern that follows a given rule.
5.OA.3. Generate two numerical patterns using two given rules.

CCSS Mathematical Practices
MP.1. Make sense of problems and persevere in solving them.
MP.4. Model with mathematics.
MP.7. Look for and make use of structure.

Next Generation Science Standards
http://www.nextgenscience.org/next-generation-science-standards
Crosscutting Concept:
Patterns

ICON KEY:

= Indicates note or reminder for teacher

☑ = Embedded assessment points in the lesson

Pre-Teach

Discuss movement safety. Introduce and explore the dance concepts of self and general space and shape. Explore making AB patterns with paper and pencil or math manipulatives. Explore creating numerical patterns.

Lesson Steps Outline

1. Prepare students for dancing patterns by discussing pattern in dance, math, and everyday living. Display dance word of the day sign: pattern. Discuss critical thinking skills and how we will use them to describe, analyze, and explain numerical patterns.

2. Lead students in *BrainDance* warm-up.
Music: #20 "Potpourri" from *Music for Creative Dance*, *Volume III, by Eric Chappelle*

3. Introduce dance concept of size. Display dance word sign for the concept. Use two different percussion instruments to cue a Move and Freeze exploration of the concept. Incorporate both self and general space, and alternate big and small size in an AB pattern.

☑ Criteria-based process assessment: Dances big and small shapes and/or movement.

4. Demonstrate and direct the AB Pattern Circle. Use critical thinking to describe and explain numerical patterns.
Music: This exploration could be done in silence or using music with a steady beat and a moderate tempo like "Up and At 'Em" #11 or "Back At Ya" #8 which has an alternating eight-count phrase, both from *Music for Creative Dance, Volume IV.*

☑ Criteria-based teacher checklist: Creates a big or small shape to extend an AB repeating sequence.
Criteria-based process assessment: Describes and explains ideas for patterns.

5. Lead a series of movements that create a numerical pattern. Ask students to use critical thinking to describe, analyze, and explain numerical patterns.

☑ Criteria-based process assessment: Repeats movements in a numerical pattern. Describes, analyzes, and explains numerical patterns.

6. Ask small groups to develop and rehearse Numerical Pattern Dances. Accompany the dances with a percussion instrument if needed.

☑ Criteria-based teacher checklist, self-assessment: Chooses a movement and a rule. Repeats movement according to the rule.

7. Lead students through a performing and responding process. Review performer and audience behavior. Guide each group to perform its dance and, after each group, ask the audience to use critical thinking to describe and analyze the rule of the pattern and explain what would come next in the pattern.

☑ Criteria-based teacher checklist and peer assessment: Chooses a movement and a rule. Repeats movement according to the rule. Describes, analyzes, and explains numerical patterns.

8. Reflect with students on patterns, dance, and critical thinking.

☑ Criteria-based reflection: Makes a connection between dance and math, and the use of critical thinking skills.

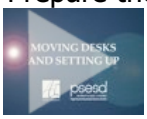
LESSON STEPS

1. Prepare students for dancing patterns by discussing pattern in dance, math, and everyday living. Display dance word of the day sign: pattern. Discuss critical thinking skills and how we will use them to analyze, describe, and explain our observations.

Although this lesson uses the dance concept of big and small size, it could also be taught with other dance concepts, for example: self and general space, high and low levels, forward and backward directions, fast and slow tempo, sharp and smooth energy.

- *Today we'll be doing a dance and math lesson about patterns.*
- *What do you know about patterns?*
- *Where do you see patterns in this room?*
- *Let's talk about critical thinking skills and how we use them to describe, analyze, and explain numerical patterns.*

Prepare the classroom for dance.



Moving Desks/Set-up

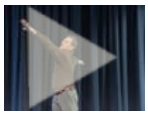
Movement Safety

2. Lead students in *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: #20 "Potpourri" from *Music for Creative Dance*, *Volume III, by Eric Chappelle*

- *This version of the BrainDance includes some AB patterns alternating big and small size. See if you can recognize them.*

Breath (before the music begins)
- *Your muscles and your brain need oxygen, so inhale through your nose and exhale through your mouth*.

Tactile (with the music)
- *Wake up your hands. Tap from the top of your head all the way to your toes.*


Pattern BrainDance

Core-Distal
- *Grow into a big shape. Shrink into a small shape.*

Head-Tail
- *Curl forwards and backwards with big movements and forwards and backwards with small movements.*
- *Curve from side to side, alternating big and small movements.*

Upper Half
- *The top half of your body dances alternating big and small movements, while the lower half is frozen.*

Lower Half

- *The lower half of your body dances alternating big and small movements, while the upper half is frozen.*

Body-Half Right, then Left

- *Your left side is frozen and only the right side dances alternating big and small movements.*
- *Now the right side is frozen and the left half dances alternating big and small movements.*

Cross-Lateral

- *Use your hands to draw lines crossing in front of your body. Alternate big and small cross-lateral movements.*

Eye Tracking

- *Keep your eyes on your right hand. Move it from one side to the other and up and down.*
- *Watch your left hand as you smoothly move it from side to side and up and down.*

Spin/Vestibular

- *Glue your arms to your sides. Turn. Freeze in a big shape. Turn. Freeze in a small shape.*

Breath

- *Breathe quietly.*
- *What AB patterns did you observe in the BrainDance?*

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3. Introduce dance concept of size. Display dance word sign for the concept. Use two different percussion instruments to cue a Move and Freeze exploration of the concept. Incorporate both self space and general space, and alternate big and small size in an AB pattern.

When assessing this criteria in this lesson, 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, to guide your future instruction.

- *How can you make a big shape safely? How can you make a small shape safely?*
- *Show me a big shape. I can tell that you are making big shapes because your fingers and toes and the tops of your heads are reaching far away from the center of your body. You are taking up a gigantic amount of space.*

Prompting for Creativity

- *Show me a small shape. I can tell you are making small shapes because all the parts of your body are scrunched close together. You are taking up the tiniest amount of space you can.*
- *How can you move with big movements safely? How can you move with small movements safely?*
- *We are going to do Move and Freeze and alternate big and small movement in an AB pattern.*
- *When you hear the drum, do a big dance, staying in one spot. When the drum stops, freeze in a big shape.*

- *When you hear the bell, do a small dance, staying in one spot. When the bell stops, freeze in a small shape.*

Repeat the AB pattern of big and small movement in self-space several times.

- *When you hear the drum, dance in the general space, traveling through all the empty space in the room with big movement. When the drum stops, freeze in a big shape.*

- *When you hear the bell, dance in the general space, traveling through all the empty space in the room with small movement. When the bell stops, freeze in a small shape.*

Repeat the AB pattern of big and small movement in general space several times.

☑ Criteria-based process assessment: Dances big and small shapes and/or movement.

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4. Demonstrate and direct the AB Pattern Circle. Use critical thinking to describe and explain patterns.

Music: This exploration could be done in silence or using music with a steady beat and a moderate tempo like "Up and At 'Em" #11 or "Back At Ya" #8 which has an alternating eight-count phrase, both from *Music for Creative Dance, Volume IV.*


AB Pattern Circle

- *Let's stand in a large circle. I'll start by making a big shape. Now the student who is on my right will make a small shape. We'll continue counterclockwise and alternate making big and small shapes until we have a full circle of shapes.*

- *Can you see our AB pattern?*

- *What other patterns could we dance as a Pattern Circle? Using critical thinking skills, describe and explain what you are thinking. Let's try one or two of your ideas for patterns.*

☑ Criteria-based teacher checklist: Creates a big or small shape to extend an AB repeating sequence.
Criteria-based process assessment: Describes and explains ideas for patterns.

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5. Lead a series of movements that create a numerical pattern. Ask students to use critical thinking to describe, analyze, and explain patterns.

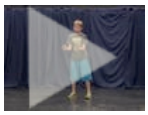
Clap in a pattern. Then write the pattern with a document camera, or on white paper or a white board.

- *Another way to look at patterns is to dance numerical patterns. We will observe the pattern then analyze, describe, and explain it using critical thinking skills.*

- *Clap high twice. 1,2. Stop. Clap low four times. 1,2,3,4. Stop. Clap high six times. 1,2,3,4,5,6. Stop. Clap low eight times. 1,2,3,4,5,6,7,8. Stop.*

- *What rule did we use?* (+2)

- *What would be next in this pattern?* (Clap high ten times.)


Numerical Pattern Dance

- *I'll notate the pattern.*

Reach in a pattern. Notate the pattern.

- *Let's try another pattern. I'll count to help you do one movement per beat. I'll reach up 6 times, stop, then reach down five times and stop.*

- *Now do it with me. Reach up six times. 1,2,3,4,5,6. Stop. Reach down five times. 1,2,3,4,5. Stop. Reach up four times. 1,2,3,4. Stop. Reach down three times. 1,2,3. Stop.*
- *What rule did we use?* (-1). *Use your critical thinking skills to describe, analyze, and explain the rule.*
- *What would be next in this pattern?* (Reach up two times.)
- *I'll notate the pattern.*

Repeat this process using other number patterns and movements suggested by students.

☑ Criteria-based process assessment: Repeats movements in a numerical pattern. Describes, analyzes, and explains numerical patterns.

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6. Ask small groups to develop and rehearse Numerical Pattern Dances. Accompany the dances with a percussion instrument if needed.

You can choose the groups in advance to keep the momentum of the class going. You can also list their names on the checklist in the order of their groups to make assessing during the performance easier.

- *In your small group, create your own Number Pattern Dance. You will choose a movement and a rule.*
- *Figure out your starting number, then extend the pattern according to your rule. Like in the previous lesson step, plan on doing a total of four. For example, if your pattern is +2 and your starting number is 2, your numerical pattern could be 2, 4, 6, 8.*
- *When you perform, the audience will try to discover your rule and extend your pattern. Your point is not to trick the audience, but to be so clear with your pattern that the audience will understand your rule and what would come next in the pattern.*
- *Practice.*
- *Are you clearly repeating the movement according to your rule?*

☑ Criteria-based teacher checklist, self-assessment: Chooses a movement and a rule. Repeats movement according to the rule.

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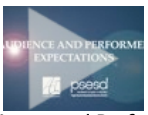
7. Lead students through a performing and responding process. Review performer and audience behavior. Guide each group to perform its dance and, after each group, ask the audience to use critical thinking to describe and analyze the rule of the pattern and explain what would come next in the pattern.

- *Performers what do you want from your audience? Audience what do you want from your performers?*



Audience and Performer Expectations

Each group performs. After each performance, ask the following questions:

- *Audience, can you analyze what you saw and explain the rule? Describe what would come next in the pattern?*

☑ Criteria-based teacher checklist and peer assessment: Chooses a movement and a rule. Repeats movement according to the rule. Describes, analyzes, and explains numerical patterns.

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8. Reflect with students on patterns, dance, and critical thinking.

- *What other patterns could you dance? How would you dance them?*
- *The next time you identify or extend a pattern in math, remember how you did it with movement. Also be aware of how you used critical thinking skills to describe, analyze, and explain your observations. What you've done with movement will help you in math.*

☑ Criteria-based reflection: Makes a connection between dance and math, and the use of critical thinking skills.

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

STUDENT SELF-ASSESSMENT WORKSHEET

Disciplines	**DANCE/MATH**	**DANCE and MATH**				Total 5
Concept	**Pattern and Size**	**Numerical Pattern**			**Critical Thinking Skills**	
Criteria Student Name	Creates a big or small shape to extend an AB repeating sequence.	Chooses a movement.	Chooses a rule.	Repeats movement according to the rule.	Describes, analyzes, and explains numerical patterns.	

CLASS ASSESSMENT WORKSHEET

Disciplines	**DANCE/MATH**	**DANCE and MATH**				Total 5
Concept	**Pattern and Size**	**Numerical Pattern**			**Critical Thinking Skills**	
Criteria Student Name	Creates a big or small shape to extend an AB repeating sequence.	Chooses a movement.	Chooses a rule.	Repeats movement according to the rule.	Describes, analyzes, and explains Numerical Patterns.	
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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: ***Pattern***

Dear Family:

Today your child participated in an **Arts and Math** lesson. We talked about patterns in dance, math, and everyday life.

- We danced using big and small shapes and movements.
- We alternated big and small shapes in an AB Pattern Circle.
- We created Numerical Pattern Dances.
- We performed our numerical pattern dances in groups and the audience figured out our rule and how to extend our pattern.
- Throughout our lesson we used critical thinking skills to describe, analyze, and explain patterns.

At home, you could look for patterns in your home and in your yard. You could write or dance the math patterns. How could you use them to make a dance, a song, or a drawing?

Enduring Understanding

Repeating body movements and shapes can represent and extend patterns.