

ARTS IMPACT

DANCE ARTS LESSON

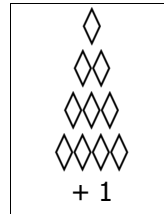
Numerical Patterns: Dance and Math Integrated Lesson

Artist/Mentor: Debbie Gilbert

Grade Levels: First Grade - Fifth Grade



Represents number patterns through dance.



Problem to Solve: How can number patterns be recognized, created, and extended?

Understanding: Repeating body movements as units by adding one movement per beat can represent and extend number patterns.

Brief Description of Task/Project

Students use the dance concepts of beat and pattern to extend number patterns using the Diamond dance structure.

Target Learning and Assessment Strategies

Knowledge and skills: *The student:*

Target: Recognizes and represents number patterns through dance.

Criteria: Recognizes, creates, and extends repeating units and series of units through use of one movement per beat.

Target: Writes and extends number patterns.

Criteria: Repeats units to create a pattern and repeats series of units to extend a pattern.

Evidence of Student Learning

movement phrases

written number patterns

Instructional Strategies for the Teacher and Student

1. Teacher: **Prompts:** *This is an integrated lesson that links dance and math. Prepares students* for dancing numerical patterns by discussing pattern in dance, math, and everyday living.

Student: Considers and discusses the shared concepts of pattern in math and dance and life.

2. Teacher: **Teaches Pattern Dance Warm-up.** **Prompts:** *Listen to the music. Can you feel the beat or count? Let's clap the beat. We'll do one shake per beat. Shake your right arm for 8 beats. Shake your left arm for 8 beats. Shake your right leg for 8 beats. Shake your left leg for 8 beats. Shake your right arm and leg for 8 beats. Shake your left arm and leg for 8 beats. Shake your whole body for 8 beats. Repeat the shaking for 4 beats each. Then repeat for two beats each. Prompt: Can anyone tell me what numerical pattern I am using? (divide by two, cut in half) End the warm up with some gentle stretching.*

Student: Warms up by repeating number pattern and then reducing number pattern.

3. Teacher: **Introduces and demonstrates the dance concept of beat.** Plays the drum for a **Move and Freeze exploration of the concept.** **Prompts:** *I am going to play a drum. I'll play even, regular beats. Start in general space. Make one step every time I hit the drum. That's one step per beat. Freeze when the drum stops. Plays about 16 beats in a medium tempo. Prompts: Now in self space, do one reach per beat. Freeze when the drum stops. Plays about 16 beats in a medium tempo. Do the same with other movements in self and general space (e.g. jump, flap elbows, gallop, twist, side slide, lift shoulders, tiptoe, push).*

Student: Moves with one movement per beat in self and general space and freezes in a shape as directed by teacher.

4. Teacher: **Introduces the concept of pattern in numbers and movements.** Leads a series of movements that create a numerical pattern. **Prompts:** *Clap twice. 1,2. Stop. Clap four times. 1,2,3,4. Stop. Clap six times. 1,2,3,4,5,6. Stop. Clap eight times. 1,2,3,4,5,6,7,8. Stop. What number pattern did we use? (+2) What would be next in this pattern? (Clap ten times.) Write the pattern on big paper or a blackboard. Now let's try another pattern. I'll count to help you do one movement per beat. Demonstrates reaching up 6 times, stopping, reaching five times and stopping. Prompts: Now do it with me. Reach six times. 1,2,3,4,5,6. Stop. Reach five times. 1,2,3,4,5. Stop. Reach four times. 1,2,3,4. Stop. Reach three times. 1,2,3. Stop. What number pattern did we use? (-1) What would be next in this pattern? (Reach two times) Writes the pattern. Repeats this process using other number patterns and movements suggested by students.*

Student: Performs claps in a pattern by adding two claps each time. Performs 'reaches' in a pattern by subtracting one reach with each repetition. Suggests and performs other number patterns and movements.

5. Teacher: **Demonstrates and directs *Diamond Follow the Leader Plus a Pattern* and *Diamond Follow the Leader Guess My Pattern*.** Demonstrates this with self and three students. *Prompts: In a group of four, you'll make a diamond formation, with everyone facing the same direction. The first leader is at one point of the diamond. You will follow that leader, then make a quarter turn to the right. Then you will have a new leader. When you repeat two more times each person will have a chance to be the leader. Before you begin, you need to add the concept of numerical pattern. Prompts: Now we'll add the concept of pattern. Let's do + 2 for our pattern and arm flapping for our movement.*

After the demonstration, asks students to form diamond groups. Directs each quartet to decide upon a numerical pattern (e.g. +2) and a movement. *Prompts: When you follow the first leader, you repeat one movement per beat corresponding to your starting number (e.g. 2). Make a quarter turn to your right and following the second leader, do a movement repeating it the same number of times as the next number in the series (e.g. 4). Continue changing leaders and extending the pattern each time. Keep the pattern simple and the numbers small.* Directs *Diamond Follow the Leader Guess My Pattern*. *Prompts: Your quartets will choose a numerical pattern, but don't tell the audience. Members of the audience, write the pattern you see using graphing or other recording strategy. Does the written pattern match the performers' pattern? What number would be next in this pattern?*

Student: Leads and follows movement, creating, extending, and recognizing patterns. Writes patterns.

Embedded Assessment: Criteria-based peer assessment through written patterns. Criteria-based teacher checklist.

6. Teacher: **Reflects with students.** *Prompts: Now that you have danced patterns, can you think of other patterns you observe or use every day?*

Student: Reflects and responds.

Vocabulary

- beat
- general space
- pattern
- self-space
- shadow

Selected Resources Dance Arts Cultural Partner Reference:

Classroom Resources:
paper, pencils

Music Resources:
Music for Creative Dance,
Contrast and Continuum, Volume
IV
drum

Student Applications of Learning

Student recognizes and uses pattern in dance and everyday living.

Essential Learnings

MEL 1.5 algebraic sense: number patterns
AEL 1.1 concepts: beat, pattern, self-space, general space
AEL 1.2 skills: performs combinations of movements

State Frameworks

Grade 1: repeats patterns of movement (repetition)
Grade 3: creates basic movement sequences using ABA, echo, canon (form)
Grade 4: improvises movement using the elements of dance;
Grade 5: creates a simple dance, combining a variety of dance elements and principles of organization

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Numerical Patterns: Dance and Math

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Target Learning and Assessment Strategies

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PERSONAL ASSESSMENTS CHECKLIST

Student	Describe your own pattern in words, pictures, or and/or numbers.	
	Describe the patterns you observed using words, pictures, or and/or numbers.	What number would come next in the pattern?
	Group 1 Group 2 Group 3 Group 4 Group 5	

ASSESSMENTS CHECKLIST

Student	Pattern			Total Points 3
	PROCESS WORK recognizes, creates and extends patterns with one movement per beat (dancing the diamond structure)	PATTERNS YOU OBSERVED OTHERS identifies dancers' pattern of repeated units and records it in writing (observing and notating the diamond)	YOUR OWN PATTERN repeats series of units to extend a pattern in writing (What number would come next in the pattern?)	
1.				
2.				
3.				
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20.				
Total				
Percentage				
Mean				
Median				

Teacher Comments:

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Dear Family:

Your child participated in a math lesson and analyzed and used **numeric patterns**.

1. We explored a variety of dance strategies to learn and practice creating and extending math patterns.
2. We considered the shared concept of **pattern** in math and dance.
3. We created and extended patterns in **self-space**, in one spot, and in **general space** throughout the classroom.
4. We created and extended **patterns in a diamond formation** small groups.
5. We used words, numbers, and/or pictures to **notate** our patterns and the patterns we observed.

At home you could look for the patterns you see in everyday living....the repeated movements as you walk, the repeated movements in different levels of space, or the repeated movements in nature.

UNDERSTANDING

Repeating body movements as units by adding one movement per beat can represent and extend number patterns.

SEQUENCE FOR TEACHING STRATEGIES IN NUMERICAL PATTERNS

1. Prompts: *This is an integrated lesson that links dance and math. Leads discussion* of pattern in dance, math, and everyday living.

2. Teaches Pattern Dance Warm-up.

Music: "Up and At 'Em" from *Music for Creative Dance, Contrast and Continuum, Volume IV*.

This is a warm-up using shaking in a pattern of arm, arm, leg, leg, half of the body, half of the body, and the whole body. The first time through the pattern shake 8 beats each time. The second time through, divide the 8 in half and you'll have 4 beats. The third time through, divide the 4 in half and you'll have 2 beats. *Prompts: Listen to the music. Can you feel the beat or count? Let's clap the beat. We'll do one shake per beat. Shake your right arm for 8 beats. Shake your left arm for 8 beats. Shake your right leg for 8 beats. Shake your left leg for 8 beats. Shake your right arm and leg for 8 beats. Shake your left arm and leg for 8 beats. Shake your whole body for 8 beats.*

Repeat the shaking for 4 beats each. Then repeat for two beats each.

Prompt: Can anyone tell me what numerical pattern I am using? (divide by two, cut in half)

End the warm-up with some gentle stretching.

3. Introduces and demonstrates the dance concept of beat.

Play a drum for a **Move and Freeze** exploration of the concept of beat. Begin with walking in general space.

Prompts: I am going to play a drum. I'll play even, regular beats. Start in general space. Make one step every time I hit the drum. That's one step per beat. Freeze when the drum stops.

Play about 16 beats in a medium tempo.

Next use arm reaches in self space.

Prompts: Now in self space, do one reach per beat. Freeze when the drum stops.

Play about 16 beats in a medium tempo. Continue the exploration with other movements. Select some self space movements and some general space movements (e.g. jump, flap elbows, gallop, twist, side slide, lift shoulders, tip toe, push).

4. Introduces the concept of pattern in numbers and movements.

Lead a series of movements that create a numerical pattern. Begin with clapping. Demonstrate first, then invite your students to repeat the pattern with you. Do one clap per beat and count out loud.

Prompts: Clap twice. 1,2. Stop. Clap four times. 1,2,3,4. Stop. Clap six times. 1,2,3,4,5,6. Stop. Clap eight times. 1,2,3,4,5,6,7,8. Stop. What number pattern did we use? (+2) What would be next in this pattern? (Clap ten times.)

Write the pattern on big paper or a blackboard.

Use a different movement: reaching.

Prompts: Now let's try another pattern. I'll count to help you do one movement per beat.

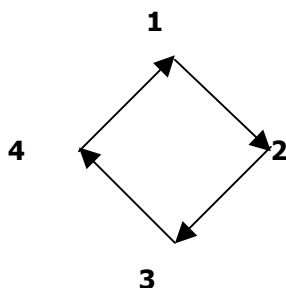
Demonstrate reaching up 6 times, stopping, reaching five times and stopping.

Prompts: Now do it with me. Reach six times. 1,2,3,4,5,6. Stop. Reach five times. 1,2,3,4,5. Stop. Reach four times. 1,2,3,4. Stop. Reach three times. 1,2,3. Stop. What number pattern did we use? (-1) What would be next in this pattern? (Reach two times) Write the pattern on big paper or a blackboard.

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

Note: With K-1 students you may want to skip strategy 5 (diamonds) and go directly to reflection.

5. Demonstrates and directs *Diamond Follow the Leader Plus a Pattern* and *Diamond Follow the Leader Guess My Pattern*. Demonstrate this with yourself and three students. In a group of four, make a diamond formation, with everyone facing the same direction. The first leader is at one point of the diamond. You will follow that leader, then make a quarter turn to the right. Then you will have a new leader. When you repeat two more times each person will have a chance to be the leader.



Before you begin, you need to add the concept of numerical pattern. Begin by demonstrating a simple pattern (e.g. +2). It is important to do one movement per beat and to count the numbers out loud. It will be easier if you agree in advance about which movement (e.g. arm flapping) you will use. The first leader will start with the starting number, doing the same number of movements as the starting number (1,2). All make a quarter turn and the next leader will extend the pattern (1,2,3,4). All make a quarter turn and the third leader will extend the pattern again (1,2,3,4,5,6). All make a quarter turn and the fourth leader will extend the pattern again (1,2,3,4,5,6,7,8). Then ask students to form diamond groups and ask everyone to do the pattern you just demonstrated.

Prompts: Now we'll add the concept of pattern. Prompts: When you follow the first leader, you repeat one movement per beat corresponding to your starting number (e.g. 2). Make a quarter turn to your right and following the second leader, do a movement repeating it the same number of times as the next number in the series (e.g. 4). Continue changing leaders and extending the pattern each time. Keep the pattern simple and the numbers small.

Direct each quartet to decide upon its own numerical pattern and movement, and explore Diamond Follow the Leader Plus a Pattern. Ask students to write their group's pattern using numbers, words, or pictures.

Directs Diamond Follow the Leader Guess My Pattern. The structure is the same as Diamond Follow the Leader Plus a Pattern, except one group at a time will show its pattern and the audience will try to guess the pattern, notate it, and choose which number would come next in the pattern.

Prompts: Your quartets will choose a numerical pattern, but don't tell the audience. Members of the audience, write the pattern you see using graphing or other recording strategy. You can use words, numbers and/or pictures. Does the written pattern match the performers' pattern? What number would be next in this pattern?

Embedded Assessment: Criteria-based peer assessment through written patterns. Teacher checklist.

Note: With younger students you can do the above exploration all in one large group.

6. Reflects with students. *Prompts: Now that you have danced patterns, can you think of other patterns you observe or use every day?*

Numerical Patterns: Dance and Math

Student	Describe your pattern in words, pictures, or and/or numbers.	
	Describe the patterns you observed using words, pictures, and/or numbers.	What number would come next in the pattern?
	Group 1	
	Group 2	
	Group 3	
	Group 4	
	Group 5	