

ARTS IMPACT LESSON PLAN

Dance and Math Infused Lesson

Lesson One: *Parts of the Whole – A Mirror Dance*

Authors: Debbie Gilbert Grade Level: First



Enduring Understanding

A whole circle or body shape can be divided into four quarters or two halves.

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

In this math and dance lesson, students observe how a circle can be divided into four quarters or two halves. Then, they explore how they can move in one spot or travel using either their whole bodies, one half of their bodies, or one fourth of their bodies. With partners, they lead and mirror using movements with one quarter of their bodies, half of their bodies, and their whole bodies.

Learning Targets and Assessment Criteria

Target: Dances with all and fractional parts of the body in self-space.

Criteria: Moves in one spot with the whole body and parts of the body.

Target: Dances with all and fractional parts of the body in general space.

Criteria: Travels with the whole body and parts of the body.

Target: Moves as a leader and follower using all and fractional parts of the body.

Criteria: Initiates and mirrors movements with a quarter of the body, half of the body, and all of the body.

Vocabulary	Materials	<u>Learning Standards</u>
<p><u>Arts Infused:</u> Part Whole</p> <p><u>Math:</u> Circle Fourth Half Quarter</p> <p><u>Arts:</u> General Space Mirror Movement Self-space Shape Space Bubble</p>	<p><u>Museum Artworks or Performance</u></p> <p><u>Seattle, WA</u> Pacific Northwest Ballet UW World Series of Dance</p> <p><u>Tacoma, WA</u> Broadway Center for the Performing Arts</p> <p>Materials Math Dances CD by Debbie Gilbert; Music for Creative Dance, Volume IV by Eric Chappelle; CD player; Models or diagrams of circles and of circles divided into halves and quarters; White board or chart paper & markers; Drum/percussion instrument; Class Assessment Worksheet</p> <p style="text-align: center;">continued</p>	<p>WA Arts Learning Standards For the full description of each anchor standard and the grade level performance standards, see: https://www.k12.wa.us/student-success/resources-subject-area/arts/arts-k-12-learning-standards Anchor Standard 1: Generate and conceptualize artistic ideas and work.</p> <p>Performance Standard (DA:Cr1.1.1): b. Explore a variety of locomotor and non-locomotor movements by experimenting with and changing the elements of dance. Anchor Standard 5: Develop and refine artistic techniques and work for presentation. Performance Standard (DA:Pr5.1.1): a. Demonstrate a range of locomotor and non-locomotor movements, body patterning, body shapes, and directionality. Anchor Standard 9: Apply criteria to evaluate artistic work. Performance Standard (DA:Re9.1.1) : a. Identify and demonstrate several movements in a dance that attracted attention. Describe the characteristics that make the movements interesting and talk about why they were chosen.</p> <p style="text-align: center;">continued</p>



Pacific Northwest Ballet images: Sarah Ricard Orza and Lucien Postlewaite in Jerome Robbins' *West Side Story Suite*



Dancers in Twyla Tharp's *In the Upper Room*

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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.G. Reason with shapes and their attributes.

1.G.3. Partition circles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of.

Describe the whole as two of or four of the shares.

CCSS Mathematical Practices

MP.2. Reason abstractly and quantitatively.

MP.3. Construct viable arguments and critique the reasoning of others.

MP.4. Model with mathematics.

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/>

(1st grade) 3. Touching, seeing, hearing, and moving

around: Using the large muscles (gross motor skills): refine skills for moving from one place to another

(locomotor skills); develop skills for moving in place (non-locomotor), such as bending and twisting.

(1st grade) 6. Learning about my world: Math: divide circles and rectangles into halves or fourths to develop understanding of part/whole. Arts: create and respond to arts; become aware of skills needed to dance around the room.

ICON KEY:

 = Indicates note or reminder for teacher

 = Embedded assessment points in the lesson

Pre-Teach

Practice the Math BrainDance, see lesson step 3. Practice constructing and deconstructing whole circles from half and quarter circles with manipulatives.

Lesson Steps Outline

1. Introduce dancing the parts of the whole. Display diagrams or models of a whole circle, a circle divided into halves, and a circle divided into quarters.

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

3. Lead students in Math BrainDance warm-up.

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

4. Direct exploration of movements with whole bodies, half of the bodies, and one quarter of the bodies in self and general space with Move and Freeze. Play a drum or other percussion instrument for accompaniment.

Criteria-based teacher checklist: Moves in one spot with the whole body and parts of the body. Travels with the whole body and parts of the body.

5. Demonstrate and guide students in mirroring with one fourth of their bodies, one half of their bodies, and their whole bodies. Analyze photos of dancers mirroring.

Music: "Monkey Fiddle Chant #7, Music for Creative Dance, Volume IV by Eric Chappelle.

Criteria-based teacher checklist: Initiates and mirrors movements with a quarter of the body, half of the body, and all of the body.

6. Lead performance of mirroring and response. Discuss performer and audience behavior.

Criteria-based teacher checklist, peer assessment: Initiates and mirrors movements with a quarter of the body, half of the body, and all of the body.

7. Guide class reflection connecting dance and math. Demonstrate adding parts to the whole with a model or diagram as you speak.

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

LESSON STEPS

- ☐ Prepare the classroom for dance.



[Moving Desks/Set-up](#)

1. Introduce dancing the parts of the whole. Display diagrams or models of a whole circle, a circle divided into halves, and a circle divided into quarters.

- Today, we are doing dance and math at the same time. We'll be Dancing Mathematicians! Dancing Mathematicians ask questions and look for answers. They can use movements with their bodies to figure out why something is true in math.
- We'll be dancing with our whole bodies, half of our bodies, and one quarter of our bodies.
- Here's a whole circle. Sometimes we'll dance with our whole bodies. (Demonstrate.)
- Here's a half circle. Sometimes we'll dance with the upper half of our bodies. (Demonstrate.) Sometimes we'll dance with the lower half of our bodies. (Demonstrate.) Sometimes we'll dance with the right half of our bodies. (Demonstrate.) Sometimes we'll dance with the left half of our bodies. (Demonstrate.)
- Here's a quarter circle. Sometimes we'll dance with one quarter or one fourth of our bodies. (Demonstrate.)

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?



[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

- Notice when we do movements with our whole bodies, half of our bodies, and one quarter of our bodies in the BrainDance warm-up.



[BrainDance by Artist Mentor](#)



[BrainDance by Students](#)

Breath

- Dancing Mathematicians, breathe softly.

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.
- When did we do movements with our whole bodies, half of our bodies, and one quarter of our bodies in the BrainDance?

4. Direct exploration of movements with whole body, half of the body, and one quarter of the body in [self-space](#) and [general space](#) with Move and Freeze.



[Prompting for Creativity](#)

Play a drum or other percussion instrument for accompaniment.

☐ When assessing the criteria in this lesson, any student not meeting criteria will be very clear to you, so you may want to use a reverse checklist, putting a "0" for students have not met criteria, rather than trying to notate those who have met criteria. You can go back later and give those who have met criteria a "1." This information will note who needs more practice, so you can return to it in the future.

- We are going to dance Move and Freeze. When I play the drum, you'll move. When the drum stops, you'll freeze in a [shape](#), like a statue. Make sure you have a [space bubble](#) around you so you don't bump or touch anyone.

a) Cue students to move with whole bodies in self-space.

- Find a perfect empty space in the room. Move with your whole body in self-space — that's staying in one spot. Freeze.
- I saw swinging, bouncing, wiggling, bending with your whole bodies. Let's do it again. (Repeat.)

b) Cue students to move with whole bodies in general space.

- Move with your whole body in general space — that's traveling in the empty space. Freeze.
- I saw stomping, jumping, sliding, flying with your whole bodies. Let's do it again. (Repeat.)
- Both dancers and mathematicians get better at something by practicing.

c) Cue students to move with half of their bodies in self and general space.

- Divide your body in half. Dance with half of your body in self-space. Freeze.
- I saw some dancers moving the top half of their bodies, some moving the lower half, some moving the right half, and some moving the left half.
- Let's do that again and this time, use a different half of your body in self-space. Freeze.
- Dance with half of your body in the general space. Freeze.
- What half of your body did you choose to move in general space? Why?

d) Cue students to move with one quarter of their bodies in self and general space.

- Divide your body in quarters — four parts. How can we do that? Dance with one fourth of your body in self-space. Freeze.
- I saw one arm flapping. I saw one leg swirling. Which quarter of your body did you move?
- Let's do that again and this time, use a different fourth of your body in self-space. Freeze.
- Dance with one quarter of your body in the general space. Freeze.
- What fourth of your body did you choose to move in general space? Why?

[Criteria-based teacher checklist:](#) Moves in one spot with the whole body and parts of the body.
Travels with the whole body and parts of the body.

5. Demonstrate and guide students in mirroring with one fourth of their bodies, one half of their bodies, and their whole bodies. Analyze photos of dancers mirroring.

Music: "Monkey Fiddle Chant #7, Music for Creative Dance, Volume IV by Eric Chappelle



[Mirroring with Quarter, Half, and Whole Bodies](#)

a) Display photographs of professional dancers mirroring.

☐ You may use these photos: Pacific Northwest Ballet: Sarah Ricard Orza and Lucien Postlewaite in Jerome Robbins' West Side Story Suite and Dancers in Twyla Tharp's In the Upper Room. You could also choose to find your own photos or videos that represent a variety of styles and cultures. You could review, for example, The UW World Dance Series, <http://uwworldseries.org/world-dance>, or search for dance videos that illustrate mirroring.

- Here are two pictures of dancers from Pacific Northwest Ballet demonstrating mirroring. What do you see?



b) Model mirroring with a student volunteer.

- You'll sit facing your partner. In all the mirroring activities, the idea is to move slowly so you are doing the same movement at the same time. This is not about tricking your partner. One person is the leader then trades. The two of you are working together leading and following. I'll lead first and use only one fourth of my body. Then my partner will lead.

c) Direct students to find a partner, and to mirror with one quarter of their bodies.

☐ Pause the music when you give cues.

- First leader, decide which fourth of your body you will move. Begin. Freeze.
- Second leader, which quarter of your body will you move? Begin. Freeze.

d) Direct students to mirror with one half of their bodies. Demonstrate adding one fourth of the body to another fourth, so you have one half of the body.

- If you add the quarter of your body that you just used to another quarter, you'll have half of your body. For example, if I have been dancing with my top right side (my right arm, my right shoulder, the right side of my face) and I add my top left side, I have the top half of my body for mirroring this time. You may mirror sitting or standing this time.

e) Direct students to mirror with their whole bodies. Demonstrate adding one half of the body to another half, so you dance with the whole body.

- Add the half of your body that you just used to the other half and you'll have a whole body. This time when you mirror, move with your whole body.

Criteria-based teacher checklist: Initiates and mirrors movements with a quarter of the body, half of the body, and all of the body.

6. Lead performance of mirroring and response. Discuss performer and audience behavior.



[Performer and Audience Expectation](#)

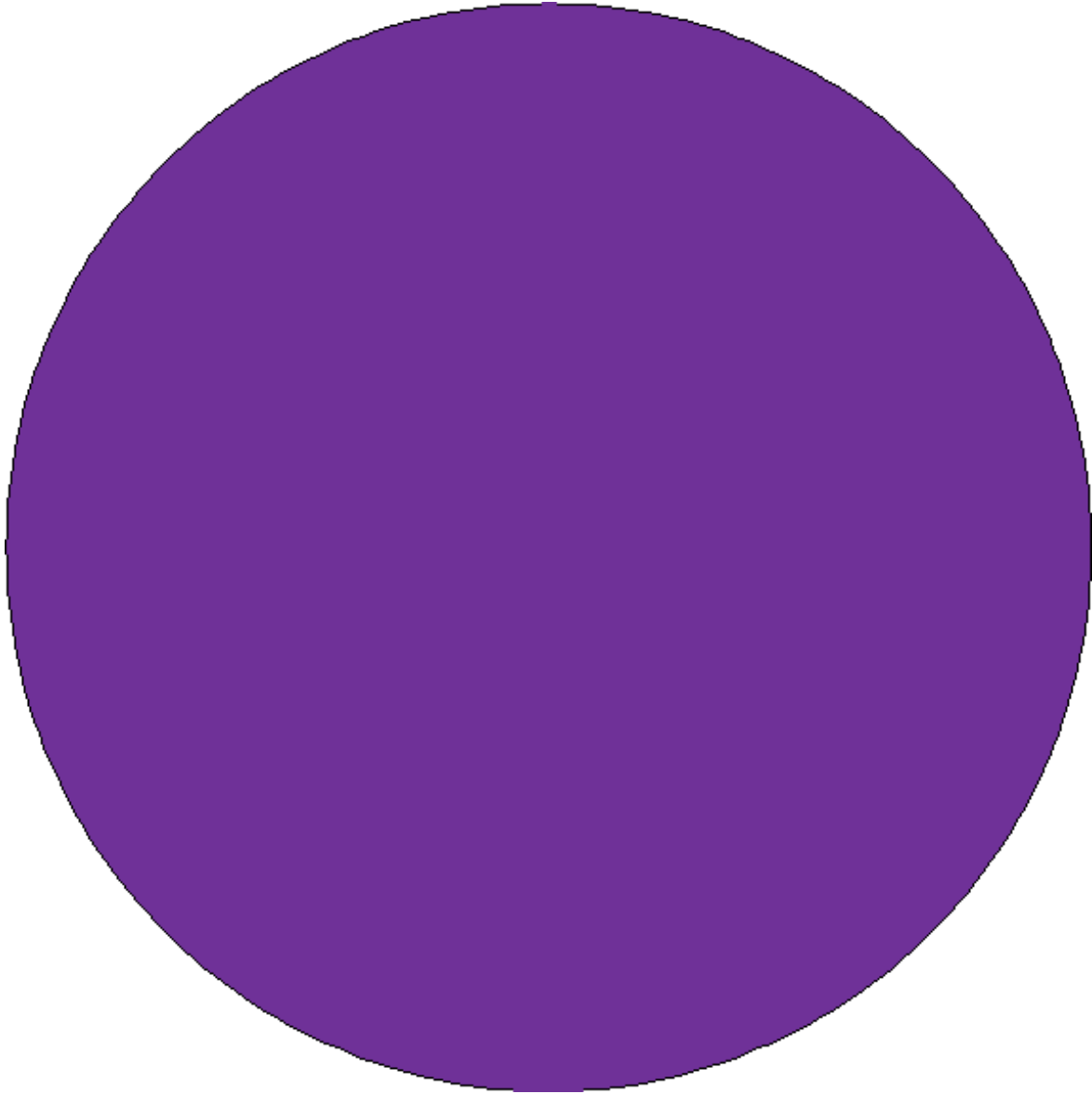
- Half of you will demonstrate mirroring with your partners, and the other half will be the audience. Then, you'll switch. The dancers can choose if they want to lead with one quarter, one half, or their whole bodies.
- Before we begin, what is the job of the audience? What is the job of the performers?
- Audience, after the performance, I'll ask you which dancers were using one fourth, which were using one half, and which were using their whole bodies. I'll also ask you how you know that it is true.

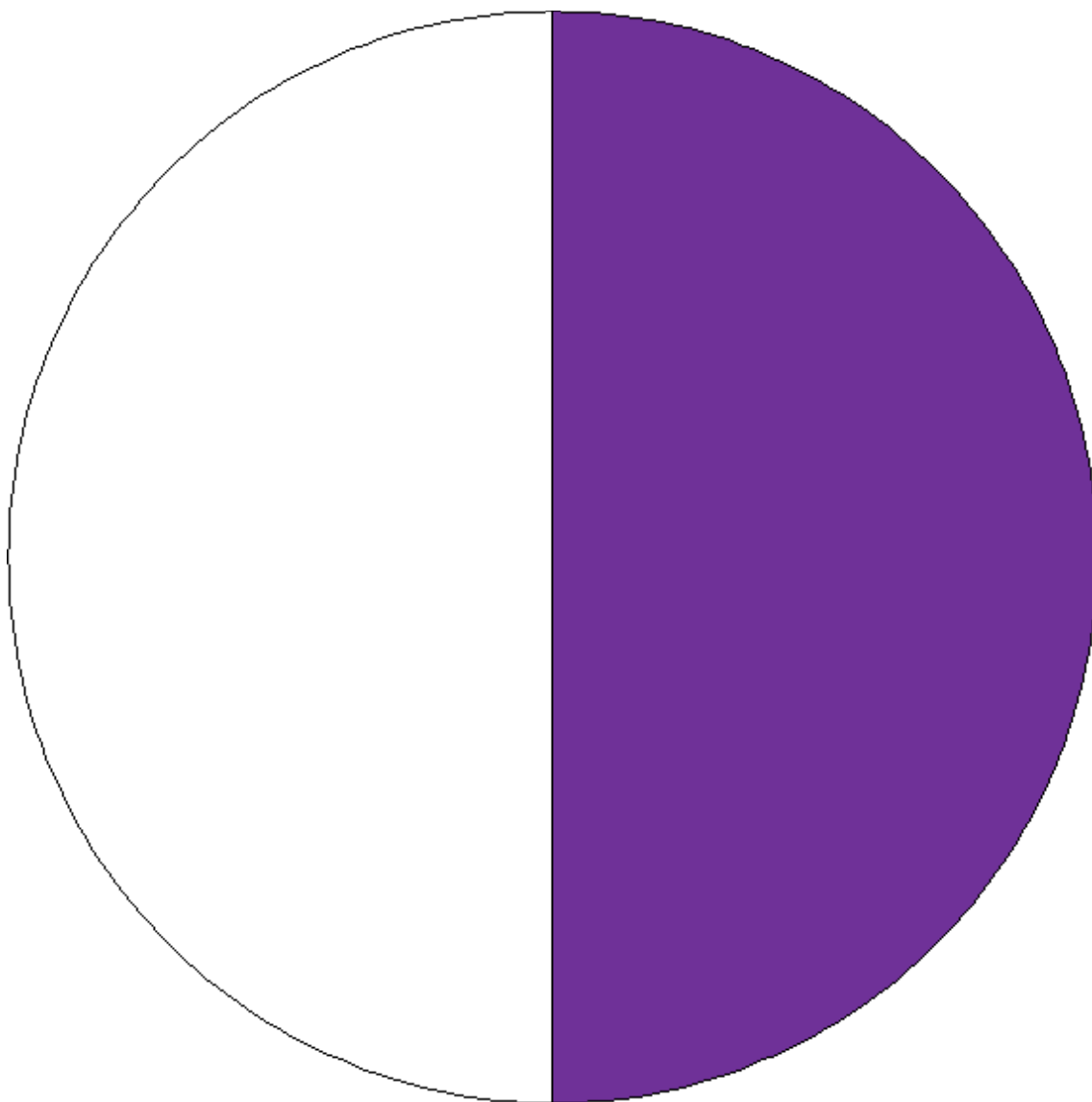
Criteria-based teacher checklist, peer assessment: Initiates and mirrors movements with a quarter of the body, half of the body, and all of the body.

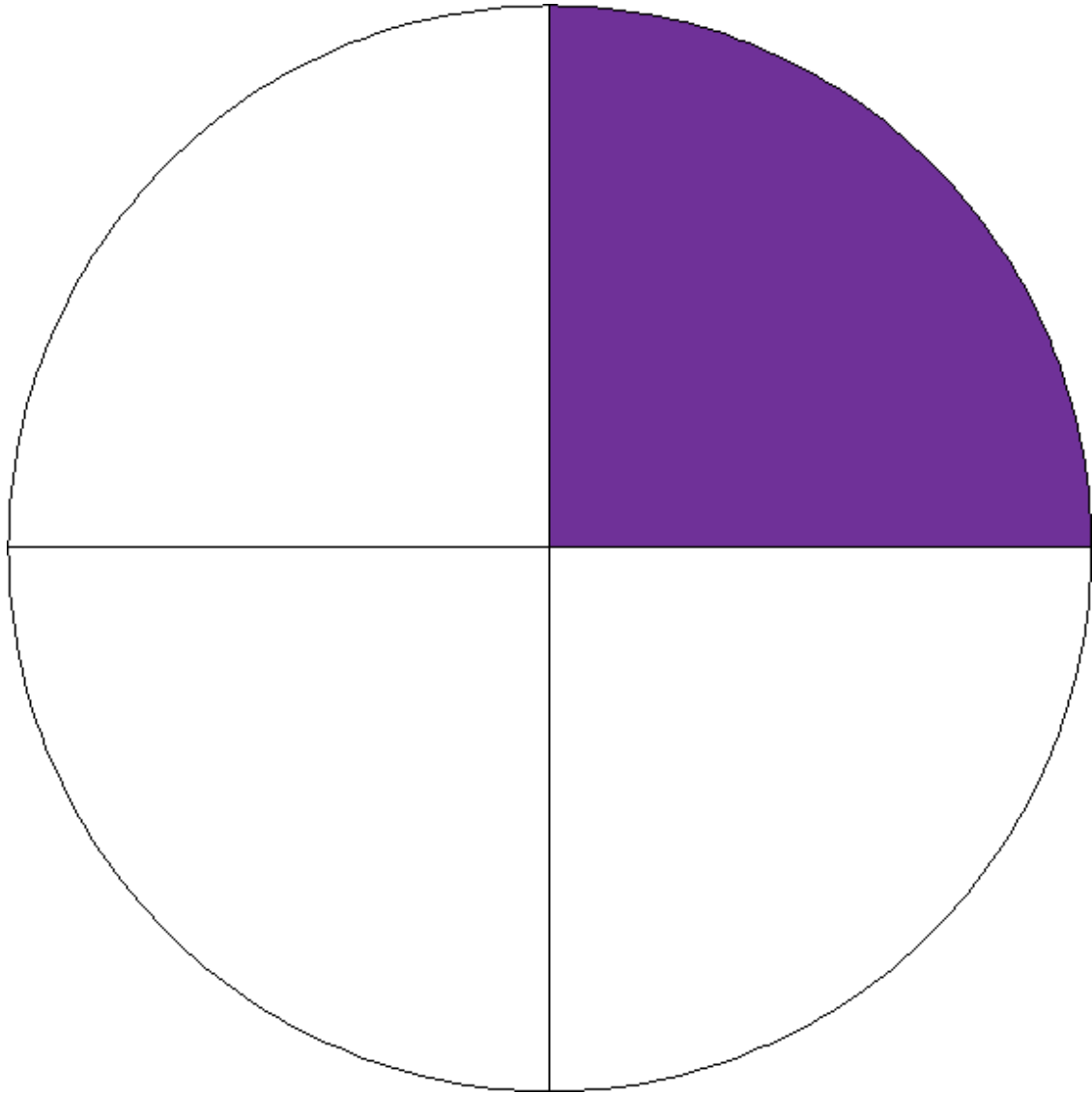
7. Guide class reflection connecting dance and math. Demonstrate adding parts to the whole with a model or diagram as you speak.

- Today, you mirrored each other using one quarter of your bodies. Then, you added a quarter of your bodies to mirror with half of your bodies. Finally, you added another half to the first half and you mirrored with your whole bodies. Dancing Mathematicians, turn and talk to someone close to you and talk about what you discovered.
- Let's look at our model (or diagram) from the beginning of the class. Which one shows the fourth or quarter of the circle? Which one shows the half circle, which is the same as two quarters? How many halves make up our whole circle? How many quarters make up our whole circle?
- The next time in math that you divide a shape into parts, or put the parts together into a whole shape, remember how you did it 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 One: Parts of the Whole: A Mirror Dance

CLASS ASSESSMENT WORKSHEET

Disciplines	DANCE/MATH							Total 7
	Self-space Parts and Whole		General Space Parts and Whole		Mirroring Parts and Whole			
Concept	Moves in one spot with the whole body and parts of the body.		Travels with the whole body and parts of the body.		Initiates and mirrors movements with a quarter of the body, half of the body, and all of the body.			
Criteria	Whole	Parts	Whole	Parts	Quarter	Half	Whole	
Student Name								
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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: _____

ARTS IMPACT FAMILY LETTER

DANCE AND MATH LESSON: Parts of the Whole: A Mirror Dance

Dear Family:

Today your child participated in an **Arts and Math** lesson. We talked about how both mathematicians and dancers can divide a circle into quarters and halves.

- We did the Math BrainDance to warm up our brains and bodies.
- We explored how we could move in one spot or travel using either our whole bodies, one half of our bodies, or one fourth of our bodies.
- We did a mirroring dance with a partner. We were leaders or mirrors using movements with one quarter of our bodies, half of our bodies, and our whole bodies.
- We performed for each other and described how we knew if the dancers were using one fourth, one half, or their whole bodies.

At home, you could divide a whole pizza into quarters or halves. Ask your child to show you how to mirror with part of your body or your whole body.

Enduring Understanding

A whole circle or a body shape can be divided into four quarters or two halves.