

ARTS IMPACT—ARTS-INFUSED INSTITUTE LESSON PLAN (YR2-AEMDD)

LESSON TITLE: Lines of Symmetry—Mirror Dance

Dance and Math Lesson

Artist-Mentor – Debbie Gilbert and Joanne Petroff

Grade Level: Fourth Grade

Examples:

Enduring Understanding

Dividing space or shape into equal, mirror sections on each side of a line creates symmetry.

Target: Creates still, physical forms, which define a line of symmetry.

Criteria: Makes body shapes that are identical, mirror images, on both sides of a vertical line through the center of the body.

Target: Performs movements that demonstrate a line of symmetry with a partner.

Criteria: Creates identical, mirror image in motion between two individuals.

Teaching and Learning Strategies

Introduction to Arts-Infused Concepts through Classroom Activities:

Arts-Infused Concepts: Lines of Symmetry; Attributes of Polygons; Congruence

📖 Introduce the BrainDance.

If time is available, explore concepts in everyday life:

- 📖 Notice movements that are the same on both sides when you move, when others move (human and animal).
- 📖 What polygon shapes do you see in the lunchroom. Are any congruent?

1. **Prepares students for dancing symmetry** by discussing symmetry in dance, math, and everyday living. *Prompts: This is an arts-infused lesson about symmetry. It is a dance lesson and a math lesson at the same time. When dancers use symmetry, they think about a line of symmetry as a vertical line from head to toes dividing their bodies into right and left halves. Pay attention to when both halves are exact mirror images (bilateral symmetry) or when they are different. Where do you see symmetry in this room?* Student: Considers and discusses the shared concepts of symmetry in math and dance and life. Bases the discussion on prior knowledge.

2. **Prepares students for dancing by creating agreements/rules for dance behavior.** Charts student response. *Prompts: How can you be creative and safe at the same time?* Student: Contributes to group agreements.

3. **Leads students in BrainDance warm-up.** (Originally developed by Anne Green Gilbert, reference: *Brain-Compatible Dance Education*, video: *BrainDance, Variations for Infants through Seniors*). Music: "Geometry BrainDance (4th grade)" #4, *Geometry Dances*. *Prompts: The BrainDance is designed to warm up your body and make your brain work better at the same time. We'll use a few examples of our dance and math word "symmetry" as we do the BrainDance. We'll also use other math*

terms like parallel and perpendicular lines, slides, and flips. We'll dance those in future classes.

Demonstrates the dance using the following sequence of movement patterns:

Breath: Inhales and exhales. Repeats. *Prompts: Your muscles and your brain need oxygen, so inhale through your nose and exhale through your mouth.*

Tactile: Rubs hands. Taps body lightly from head to toe. Stomps feet. *Prompts: Use both hands tapping together equally on each side of your body creating **symmetrical** movement. When you stomp your feet are you doing symmetrical movement?*

Core-Distal: Gradually increases the size of the body, growing from the center of the body into a **large symmetrical shape** and then shrinking back into a small shape. Repeats. *Prompts: Make a big **symmetrical square** shape. Shrink into a small shape. Grow into a big **symmetrical rectangle** shape. Shrink into a small shape. Grow into a big **symmetrical rhombus** shape. Shrink into a small shape.*

Head-Tail: Curls the body forward and backward with head and tailbone. Repeats. Curls from side to side. Repeats. *Prompts: Curl forward and back. That's **symmetrical** movement. Curl from side to side. Is that symmetrical?*

Upper Half and Lower Half: Stabilizes the lower half of the body and only the upper half dances, drawing **parallel and perpendicular lines** with different body parts. *Prompts: The top half of your body is in motion, while the lower half is frozen. Draw parallel lines in the air with your hands, then with your elbows. Draw perpendicular lines with your arms.* Stabilizes the upper half of the body, and only the lower half dances, staying in one spot, drawing **parallel and perpendicular lines** with different body parts. *Prompts: The lower half of your body is in motion, while the upper half is frozen. Draw parallel lines on the ground with your feet, then in the air with your knees. Draw perpendicular lines on the ground with your feet, then in the air with your legs.*

Body-Half Right and Left: Stabilizes the left side of the body and only the right side dances, drawing **parallel and perpendicular lines** with an arm and a leg. Repeats on the opposite side. *Prompts: Your left side is frozen and only the right side dances. Draw parallel and perpendicular lines with your right arm and leg. Now the right side is frozen and the left half dances. Draw parallel and perpendicular lines with your left arm and leg.*

Cross-Lateral: Reaches across the body with one hand and then the other. Crosses the center of the body, drawing **parallel lines** with the arms. Repeats several times. Crosses the center of the body, drawing **perpendicular lines** with the arms. Repeats several times. *Prompts: Use your hands to draw parallel lines crossing in front of your body. Now let's draw perpendicular lines.*

Vestibular: Makes a **triangle shape** with whole body. **Slides** the shape twice to the right. **Flips** the shape two times (180° turn to the right/clockwise). Repeats two slides and two flips to the left. Does the same with a **rectangle** and a **pentagon**. *Prompts: Make a triangle shape. How many **vertices** does it have? We'll move to the right first. Slide. Slide. Flip. Flip. To the left. Slide. Slide. Flip. Flip. Make a rectangle shape. How many **vertices** does it have? We'll move to the right first. Slide. Slide. Flip. Flip. To the left. Slide. Slide. Flip. Flip. Make a pentagon shape. How many **vertices** does it have? We'll move to the right first. Slide. Slide. Flip. Flip. To the left. Slide. Slide. Flip. Flip. Inhale. Exhale. Inhale. Exhale.*

Prompts: When did you use symmetry in the BrainDance?

Student: Participates in warm-up according to teacher prompts.

4. Introduces making symmetrical shapes. Cues exploration of symmetrical shapes with a drum beat. *Prompts: When you are frozen, like a statue, you are in a **shape**. When both sides of your shape are the same, you are making a symmetrical shape. Every time I hit the drum, make a different symmetrical shape. Check your shape. If you drew a line right down the center of your body, would both sides be the same?*

Student: Explores symmetrical shapes as cued by teacher.

Embedded Assessment: Criteria-based room scan; criteria-based self-assessment

5. Introduces the dance concepts of locomotor and non-locomotor movement.

- a. **Demonstrates the concepts.** *Prompts: **Locomotor movements** move the body through space. They travel. Actions of the body that do not cover space and stay in one spot are **non-locomotor movements**.*
- b. **Leads a Move and Freeze exploration of locomotor and non-locomotor movements and symmetrical shapes.** *Plays the drum and cues the students. **Prompt: When you hear the music you move and when it stops, you freeze in a symmetrical shape. Use a locomotor move, like hopping, to travel through the empty space in the room. (Plays drum for a few seconds then stops playing.) Freeze in a symmetrical shape. Use a non-locomotor move, like stretching, to move in one spot. (Plays drum for a few seconds then stops playing.) Freeze in a symmetrical shape.** Repeats with other locomotor movements (e.g. walk, skip, crawl) and non-locomotor movements (e.g. shake, bend, twist). Refers to locomotor and non-locomotor movement chart for additional suggestions.*

Student: Explores concepts as cued by teacher.

Embedded Assessment: Criteria-based room scan

6. Leads a Mirroring Dance that demonstrates symmetrical movement with a partner.

Music: "Whales" #1 or "Little Bolero" #12 from *Music for Creative Dance, Volume II*.

- a. Demonstrates and then guides the mirroring with **one line of symmetry**. Sits facing a partner. Describes the line of symmetry as an imaginary line running along the floor between the partners (perpendicular to the partners). Explains effective leading and following in the mirror exploration. Reminds partners to keep eye contact. *Prompts: 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 to create symmetrical movement on both sides of one line of symmetry.*
- b. Leads mirroring with **two lines of symmetry**. *Prompts: Now let's use two lines of symmetry. One is the line on the floor between you and the other is a line drawn down the center of your body, so movement of both the left and right sides of your body will be the same.* Variations: sitting or standing, drawing symmetrical shapes in the air (rectangle, square, rhombus, pentagon, hexagon, octagon).
- c. Directs the **Butterfly Mirror (one line of symmetry)**. The partners stand side by side at an oblique angle. Demonstrates with a piece of folded paper that is not open completely flat so that students understand they can see each other as they are moving. *Prompts: Try the butterfly-type mirror. As partners you are now standing side by side, almost shoulder to shoulder. The line of symmetry is between the partners' adjacent sides. It might help to think of this as though you are a butterfly with each person being a set of wings on either the right or left side of the body. Keep eye contact! Take turns being the leader.*
- d. Asks students to do a **pair-share reflection**. *Prompts: Discuss with your partner what choices were successful in creating symmetry and why.*

Student: Works with a partner in a sitting mirror and then butterfly-type mirror activity. Reflects.

Embedded Assessment: Criteria-based teacher checklist; criteria-based peer assessment

7. Leads students through an informal showing of Mirroring followed by a responding process.

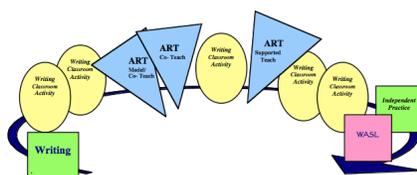
- a. **Performing**: Asks half the class to perform the Mirroring Dance and half to be the audience, then switch roles. Gives dancers the choice to do either one or two lines of symmetry, including

“butterfly” mirror symmetry, and to either sit or stand. Discusses performer and audience behavior. *Prompts: You have been doing some fascinating examples of symmetrical movements and I’d like you to have a chance to see what it looks like. You and your partner can decide to show either one or two lines of symmetry, including “butterfly” mirror symmetry, and you can sit or stand. Before you begin, performers, what do you want from your audience? Audience, what do you want from your performers?*

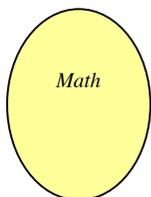
- b. **Responding:** After each half of the class performs, asks the following questions. *Prompts: Which duos showed one line of symmetry? Where was the line of symmetry? Which duos showed two lines of symmetry? Where were the lines of symmetry? Did the dancers use locomotor or non-locomotor movement? (non-locomotor) How did you know?*

Student: Performs the dance and responds.

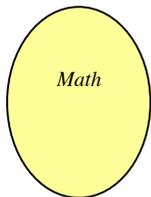
Embedded Assessment: Criteria-based teacher checklist; criteria-based class critique



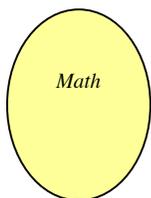
Before next DANCE lesson:



1. Repeat the BrainDance frequently to reinforce the learning.



2. Explore the math concepts using your math curriculum.



If time is available, explore the concepts in other ways:

3. Identify and draw symmetrical shapes.
4. Cut a shape in half and draw the mirror image.
5. Repeat the Mirror Dance with leaders drawing shapes in the air to review attributes of shapes.; repeat the Mirror Dance with leaders drawing parallel or perpendicular lines.

**Independent Practice: Hand dance it! Draw it on paper!
Symmetry—Both sides the same—A mirror image!**

Vocabulary	Materials and Community Resource	WA Essential Learnings & Frameworks
<p><u>Arts:</u> locomotor movement non-locomotor movement shape</p> <p><u>Arts Infused:</u> flip lines of symmetry parallel perpendicular slide symmetrical</p>	<p>Museum Artworks or Performance: Broadway Center for the Performing Arts, Tacoma, WA: <i>Do Jump, Peking Acrobats</i></p> <p>Art Materials or Performance Materials: CD player <i>Music for Creative Dance, Volume II</i> <i>Geometry Dances</i> drum BrainDance chart blank big paper for group agreement chart markers locomotor and non-locomotor movement chart piece of folded paper assessment checklist</p>	<p><i>AEL 1.1 concepts:</i> symmetrical shapes <i>AEL 1.1.2 principles of organization:</i> improvises and mirrors <i>AEL 1.2 skills and techniques:</i> mirroring <i>AEL 1.4: audience skills</i> <i>AEL 2.1 applies creative process: develops ideas and techniques</i> <i>AEL 4.2: dance and math connection</i></p> <p><i>MEL 1.3.1 geometric sense:</i> understands concept of line symmetry in two-dimensional shapes and figures</p> <p>Math State Frameworks <i>Grade 4:</i> identifies symmetrical two-dimensional figures and shapes; identifies and draws a line of symmetry</p>

ARTS IMPACT—ARTS-INFUSED INSTITUTE LESSON PLAN (YR2-AEMDD)

LESSON TITLE: Lines of Symmetry—Mirror Dance

ASSESSMENT WORKSHEET

Disciplines	DANCE AND MATH	DANCE AND MATH	Total
Concept	SYMMETRY--Shapes	SYMMETRY-- Mirroring	2
Students	Makes body shapes that are identical, mirror images, on both sides of a vertical line through the center of the body	Creates identical, mirror image movements in motion between two individuals	
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
Total			
Percentage			

Criteria-based Reflection Questions: (Note examples of student reflections.)

Self-Reflection: *Where do you find symmetry in the world around us? In art? In architecture? In nature?*

Peer to Peer: *What movement choices were successful in creating symmetry? Why?*

Thoughts about Learning:

Which prompts best communicated concepts? Which lesson dynamics helped or hindered learning?

Lesson Logistics:

Which classroom management techniques supported learning?

Teacher: _____ Date: _____

ARTS IMPACT—ARTS-INFUSED LEARNING FAMILY LETTER

DANCE AND MATH LESSON – Lines of Symmetry—Mirror Dance

Dear Family:

Today your child participated in a **dance and math** lesson. We talked about how **lines of symmetry** can be found in dance, math, and in the world around us.

- We made **shapes** that were **symmetrical** so that the right and left halves were the same.
- We worked with a partner to discover how we could create identical, **mirror image movements** with one or two lines of symmetry.
- We learned that matching shapes or movements on either side of a center line creates symmetry.
- We learned that by dancing symmetry, we could remember symmetry and could apply it when we did math.

You could look at home for examples of symmetrical objects or designs. Look for items that are exactly the same or equal on each side of a line that divides them in half. Ask your child to show you how to do the mirror dance.

Enduring Understanding

Dividing space or shape into equal, mirror sections on each side of a line creates symmetry.