

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

LESSON TITLE: Angles: Shapelines

Dance and Math Lesson

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Grade Level: Fifth Grade

Examples:

## **Enduring Understanding**

Two lines/rays that share an endpoint form an angle.

**Target:** With partners, creates a shapeline that demonstrates understanding of angles.

**Criteria:** With a group, uses rays that meet at an endpoint and makes a line of shapes that show a right angle ( $90^\circ$ ), acute angle ( $<90^\circ$ ) or obtuse angle ( $>90^\circ$ ).

**Target:** Understands characteristics of angles.

**Criteria:** Identifies, draws, and describes right angles ( $90^\circ$ ), acute angles ( $<90^\circ$ ) or obtuse angles ( $>90^\circ$ ) in performed shapelines.

## **Teaching and Learning Strategies**

### **Introduction to Arts-Infused Concepts through Classroom Activities:**

#### **Arts-Infused Concepts: Angles**

🎵 Do the BrainDance.

*If time is available, explore concepts in everyday life:*

- 🎵 Notice what angles you make when you turn a corner while walking or riding in a car.
- 🎵 Notice what angles you make with your body when you are sitting.

1. **Prepares students for dancing angles** by discussing in dance, math, and everyday living.

*Prompts: This is an arts-infused lesson about angles that links dance and math. What do you know about angles? (opening formed when two lines share an endpoint, a right angle is  $90^\circ$ , etc.)*

*What is an **acute angle**? Make these angles with your hands:  $60^\circ$ ,  $45^\circ$ ,  $30^\circ$ . Where do you see an acute angle in the room?*

*What is a **right angle**? Show me a right angle with your hands. Find a right angle in the room.*

*What is an **obtuse angle**? Show me an obtuse angle with your hands. Find an obtuse angle in the room.*

*Student: Considers and discusses the shared concepts of angles in math and dance and life. Bases the discussion on prior knowledge.*

2. **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 (5th grade)" #5, *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 math concepts as we do the BrainDance. Look for symmetry, parallel and perpendicular*

*lines, angles, slides, and flips.* Hint: In the parts of the BrainDance that specify right or left sides—when you are leading you can be a mirror for the students (so you do left when they do right) or you can face away from them (so you do right when they do right).

**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 triangle** shape. How many **vertices** are you showing? Shrink into a small shape. Grow into a big **symmetrical quadrilateral** shape. How many **vertices** are you showing? Shrink into a small shape. Grow into a big **symmetrical pentagon** shape. How many **vertices** are you showing? Shrink into a small shape.*

Head-Tail: Curls the body forward and backward with head and tailbone holding arms in parallel lines overhead. Repeats. Curls from side to side with arms making perpendicular lines. Repeats. *Prompts: Curl forward and back while reaching your arms up in **parallel lines**. That's **symmetrical** movement. Curl from side to side with your arms in **perpendicular lines**. 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, making **angles** with an arm and/or a leg. Repeats on the opposite side. *Prompts: Your left side is frozen and only the right side dances. Use your arm or leg and the side of your body to make angles. Can you make a 90° angle? 60°? 45°? 30°? Obtuse? Now the right side is frozen and the left half dances. Make angles with the left side.*

Cross-Lateral: Reaches across the body with one hand and then the other. Crosses the center of the body, defining a 45° **angle** between the arm and body. Repeats several times with arms.

**Flips** (makes a reflection) shape from side to side. Like opening and closing a book. *Prompts: This is the cross-lateral dance. Reach your arm across your body. Notice you are making a 45° angle between your arm and your body. Alternate arms. Now flip, make a reflection, like opening and closing a book. Flip. Flip. Flip.*

Vestibular: Makes a **shape** with whole body. **Slides** the shape (makes a translation) to the right, left, right, left. Does four 90° turns. **Slides** the shape to the right, left, right, left. Does two 180° turns. **Slides** the shape to the right, left, right, left. Does one 360° turn. *Prompts: Make a shape. Slide it (make a translation) right, left, right, left. Four 90° turns: 1,2,3,4. Make a shape. Slide it (make a translation) right, left, right, left. Two 180° turns: 1,2. Make a shape. Slide it right, left, right, left. One 360° turn: 1.*

*Inhale. Exhale. Inhale. Exhale.*

*Prompts: When did you use angles in the BrainDance?*

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

**3. Introduces making shapes with angles.** Challenges students to make shapes with their bodies that include right angles, angles that are greater than right angles (obtuse), angles that are less than right angles (acute), and  $60^\circ$ ,  $45^\circ$ ,  $30^\circ$  angles. Cues exploration of shapes with a drum beat. *Prompts: Freeze in a shape that shows a right angle with an arm and your side. Freeze in a shape that shows a  $45^\circ$  angle with your legs. Make a  $60^\circ$  angle with your arm and side. Is that greater or less than a right angle? Now make an angle that is greater than  $90^\circ$ . Use different parts of your body to make a  $30^\circ$  angle. Because you are a dancer and working with your body, you will actually be making many different angles at once. In order to show the angle you are trying to demonstrate, focus on it with your eyes. Every time I hit the drum, make a shape with a different angle. Check your shape. Pick an angle in your shape, what size is it?*

Student: Explores shapes with angles as cued by teacher.

Embedded Assessment: Criteria-based room scan and self-assessment

**4. Demonstrates and directs Shapelines with Angles.**

- a. **Introduces Shapelines.** With a few student volunteers, chooses an angle: right (a  $90^\circ$  angle), acute (an angle that is less than  $90^\circ$ , like a  $30^\circ$ ,  $45^\circ$ , or  $60^\circ$  angle) or an obtuse angle (an angle that is greater than  $90^\circ$ ). Asks one student to make a shape with the angle and to focus on that angle. Asks the next student to make a shape next to the first student and to make a different shape with the same angle and to focus on that angle. Asks four more students to join the line, one at a time, and make shapes with the chosen angle. Points out how all six dancers have formed a line of shapes with angles. Directs the audience to identify and describe the angles that they see. *Prompts: We are going to make a shapeline. First, we'll choose which angle we want to show in our shapeline. Each dancer travels through the space (so that's a locomotor movement) to a place in a line. Then you stay in one spot (non-locomotor) and make a shape with an angle. In order for the audience to see your angle, focus on it with your eyes. We'll add one dancer at a time until we have a line of shapes. Now look at the shapeline. Where do you see the angle? Can you identify it? Can you describe it?* Music is optional. You could use a drum, or "Pizz.Ah!" #5, *Music for Creative Dance, Volume II* or silence.
- b. **Guides students to build shapelines in small groups.** Divides class into groups of about 6 and directs them to practice making shapelines with angles. *Prompts: With your group, select an angle. You can choose a right (a  $90^\circ$  angle), acute (an angle that is less than  $90^\circ$ , like a  $30^\circ$ ,  $45^\circ$ , or  $60^\circ$  angle) or an obtuse angle (an angle that is greater than  $90^\circ$ ). Practice making a shapeline. Each dancer will make a shape with the angle you have chosen as a group. In order for the audience to see your angle, focus on your angle with your eyes. Add one dancer at a time until you have a line of shapes.*

Student: Identifies angles. Describes angles. Makes a shape with an angle as part of a shapeline.

Embedded Assessment: Criteria-based teacher checklist and self-assessment

**5. Guides performance and response to Shapelines with Angles.** Distributes Shapeline Audience Worksheets. Reviews performer and audience expectations. Asks each group to perform its shapeline and asks the dancers to hold their shapes as the audience draws the angles observed. After the performance, collects worksheets, then invites the audience to identify the angle each group selected. *Prompts: Remind me. What do the performers want from their audience? What does the audience want from the performers? Each group will perform its shapeline and hold the shapes. The audience members will try to identify the angle chosen by the group and to draw and describe the angle.*

Student: Creates a shapeline. Identifies, describes, and draws angles.

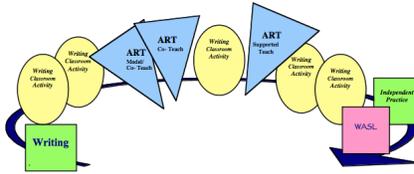
Embedded Assessment: Criteria-based teacher checklist and peer assessment

**6. Leads a class reflection** about dance and math. *Prompts: You can do a "hand dance" to remember what you have learned about angles. Just use your hands to make different angles on your*

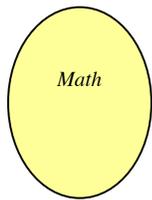
desk or in the air. What other ideas do you have to remember what you learned by dancing angles when it is time for doing math with pencils and paper?

Student: Experiments with a "hand dance." Reflects and responds.

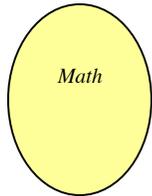
Embedded Assessment: Criteria-based group reflection



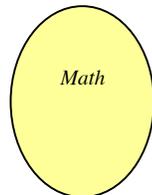
### Before next DANCE lesson:



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. Photograph shapelines and identify and describe the angles.
4. Draw figures of dancers and label the angles.
5. Do Rhombus Shadowing with angles.
6. Repeat shapelines with different angles or with other math concepts like symmetry, or parallel and perpendicular lines; Review angles with "hand dances."

**Independent Practice: Hand dance it! Draw it on paper! Acute angle—less than  $90^\circ$ . An obtuse angle—more than  $90^\circ$ . A right angle—exactly  $90^\circ$ .**

Vocabulary	Materials and Community Resource	WA Essential Learnings & Frameworks
<p><u>Arts:</u>  focus  locomotor movement  non-locomotor movement  shape</p> <p><u>Arts Infused:</u>  90°, 30°, 45°, or 60° angles  acute  angle  flip  line segment  lines of symmetry  obtuse  parallel  pentagon  perpendicular  quadrilateral  right angle  slide  symmetrical  triangle</p>	<p><b>Museum Artworks or Performance:</b>  Broadway Center for the Performing Arts, Tacoma,  WA: <i>Do Jump, Peking Acrobats</i></p> <p><b>Art Materials or Performance Materials:</b>  CD player  <i>Music for Creative Dance, Volume II</i>  <i>Geometry Dances</i>  drum  BrainDance chart  assessment checklist  Shapeline Audience Worksheets  pencils</p>	<p><i>AEL 1.1 concepts:</i> shape  <i>AEL 1.1.2 principles of organization:</i> creates a simple dance  <i>AEL 1.2 skills and techniques:</i> uses dance concepts, performs  <i>AEL 1.4 audience skills</i>  <i>AEL 2.1 applies creative process:</i> gathers information  <i>AEL 4.2: dance and math connection</i></p> <p><i>MATH GLE: 1.3.1 geometric sense:</i> understands properties of angles</p> <p><b>Math State Frameworks</b>  <i>Grade 5:</i> draws, describes, and/or labels angles</p>

# **ANGLE: SHAPELINE AUDIENCE WORKSHEET**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

What angle did the group demonstrate?	Draw the angle.	Describe the angle.
Group 1		
Group 2		
Group 3		
Group 4		
Group 5		

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LESSON TITLE: Angles: Shapelines

## ASSESSMENT WORKSHEET

Disciplines Concept	DANCE AND MATH ANGLES <b>Shapeline</b>	MATH ANGLES <b>Audience Worksheet</b>			Total 4
Student	With a group, uses rays that meet at an endpoint and makes a line of shapes that show a right angle ( $90^\circ$ ), acute angle ( $<90^\circ$ ) or obtuse angle ( $>90^\circ$ )	Recognizes right angles ( $90^\circ$ ), acute angles ( $<90^\circ$ ) or obtuse angles ( $>90^\circ$ ) in performed shapelines.			
		Identifies	Draws	Describes	
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
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11.					
12.					
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21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
Total					
Percentage					

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

**Self-Reflection:** *What other ideas do you have to remember what you learned by dancing angles when it is time for doing math with pencils and paper?*

**Peer to Peer:** *Where do you see the angle? How did you identify it? How can you describe it?*

**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**

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### **DANCE AND MATH LESSON – Angles – Shapelines**

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Dear Family:

Today your child participated in a **dance and math** lesson. We talked about **types of angles**, where we might see them in the world around us, and how we could draw them and make them with our bodies.

- We explored making shapes that showed different angles:
  - ▮ **right** or  $90^\circ$  angle
  - ▮ **acute**, an angle that is less than  $90^\circ$ , like a  $30^\circ$ ,  $45^\circ$ , or  $60^\circ$  angle
  - ▮ **obtuse**, an angle that is more than  $90^\circ$
- We selected an angle with a small group and made a group **shapeline** to demonstrate that angle.
- We observed the shapelines of other groups and identified, drew, and described their angles.
- We learned that by both studying angles in math and by dancing them, it is easier to remember how to identify them and describe their characteristics.

You could identify and describe angles you see indoors and outdoors. Ask your child to show you how you can make those angles with your body.

### **Enduring Understanding**

Two lines/rays that share an endpoint form an angle.