artsNOW
Integrated learning solutions

UNIT: GEOMETRY
GEOMETRY IN MOTION (Lesson 1 of 5)
Grade Band: 4
Content Focus: Dance & Math

LEARNING DESCRIPTION

In this math and dance lesson, students will create a dance phrase that expresses geometry vocabulary through movement. They will close the lesson by reflecting on their work and learning through a journal response. *This lesson should occur after the geometry vocabulary has been introduced.*

LEARNING TARGETS

Essential Questions	"I Can" Statements
How can we use our bodies to represent different geometric concepts like angles, lines, line segments, rays and points? How can we collaborate effectively to ensure our dance phrase accurately represents each geometric concept?	I can work with a group to create a dance phrase that illustrates angles, lines. line segments, rays and points.

GEORGIA STANDARDS

Curriculum Standards	Arts Standards
4.GSR.7.1 Recognize angles as geometric shapes formed when two rays share a common endpoint. Draw right, acute, and obtuse angles based on the relationship of the angle measure to 90 degrees. 4.GSR.8.1 Explore, investigate, and draw points, lines, line segments, rays, angles (right, acute, obtuse), perpendicular lines, parallel lines, and lines of symmetry. Identify these in two-dimensional figures. 4.GSR.8.2 Classify, compare, and contrast polygons based on lines of symmetry, the presence or absence of parallel or perpendicular line segments, or the presence or absence of angles of a specified size and based on side lengths.	ESD4.CR.1 Demonstrate an understanding of the choreographic process. ESD4.PR.2 Understand and model dance etiquette as a classroom participant, performer, and observer. a. Demonstrate attentiveness, full participation, and cooperation with others in the dance learning and performing environment. ESD4.RE.1 Demonstrate critical and creative thinking in dance. a. Critique a dance performance using elements of dance (e.g. body, space, time, energy) and appropriate dance terminology. ESD4.CN.3 Integrate dance into other areas of knowledge.

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
4.G.1 Draw points, lines, line segments, rays, angles (i.e., right, acute, obtuse), and parallel and perpendicular lines. Identify these in two-dimensional figures. 4.G.2 Classify quadrilaterals based on the presence or absence of parallel or perpendicular lines. 4.G.3 Recognize right triangles as a category, and identify right triangles. 4.G.4 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line symmetric figures and draw lines of symmetry.	**Anchor Standard 1:** I can use movement exploration to discover and create artistic ideas and works. **Anchor Standard 2:** I can choreograph a dance. **Anchor Standard 3:** I can perform movements using the dance elements. **Anchor Standard 7:** I can relate dance to other arts disciplines, content areas, and careers.

KEY VOCABULARY

Content Vocabulary	Arts Vocabulary

• Right angle - An angle whose measure is exactly 90°
• Acute angle - An angle whose measure is between 0° and 90°
• Obtuse angle - An angle whose measure is between 91° and 180°
• Line - A straight path that goes on forever in both directions
• Line segment - A part of a line that has two endpoints
• Ray - A part of a line that starts at one point and goes on forever in one direction
• Point - A tiny spot that shows a specific place
• Equilateral triangle - A three-sided figure with sides of equal length
• Isosceles triangle - A three-sided figure with two sides of equal length
• Scalene triangle - A three-sided figure with no sides equal in length
• Parallelogram - A quadrilateral with both pairs of opposite sides being parallel to one another
• Pentagon - A five-sided polygon
• Rectangle - A parallelogram with four right angles
• Rhombus - A parallelogram with four sides of equal length
• Square - A plane figure with four equal straight sides, opposite sides being parallel, and four right angles
	• Body shape - Refers to an interesting and interrelated arrangement of body parts of one dancer; the visual makeup or molding of the body parts of a singular dancer; the overall visible appearance of a group of dancers (they may be curved/angular, symmetrical/asymmetrical, positive/negative)
	• Movement - How you use your body to do a dance or action
	• Choreographer - The person who creates the dance
	• Choreography - The art of designing and arranging sequences of movements, steps, and gestures to create a dance piece
	• Dance phrase - Short sequence of movements
	• Energy - The quality and intensity of movement; how a dancer uses their body to convey emotions, mood, or intention through variations in force, flow, and dynamics
	  ○ Percussive - Refers to the quality of movement characterized by sharp starts and stops; staccato jabs of energy
	  ○ Sustained - Smooth and unaccented; there is not apparent start or stop, only a continuity of energy
	  ○ Swinging - Established by a fall of gravity, a gain in momentum, a loss of momentum, and the repeated cycle of fall and recovery, like that of a pendulum
	  ○ Vibratory - A quality of movement characterized by rapidly repeated bursts of

• Trapezoid - A quadrilateral with at least one pair of parallel sides	percussive movements like “a jitter”

MATERIALS

- Interactive whiteboard or chart paper
- Upbeat Instrumental song selection
- Sound source and speakers
- Geometry Dance Rubric
- Requirements for dance phrase

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

- Play “Shape it, Move It”.
  - When the music plays, students move, staying in their personal space.
  - Stop the music to prompt students to freeze in a body shape that expresses the vocabulary word that you call out.
    - Repeat the process for acute, right, and obtuse angles, line, ray, line segment, and point.
    - Display an image of each word after students have frozen for them to check.
  - Debrief the exercise discussing how students used their bodies in different ways to communicate ideas.
    - Explain to students that dancers and choreographers also use their bodies to communicate ideas.

Work Session

- Show students images of dancers from the PowerPoint. Ask students to identify the lines, angles, and shapes that the dancers make with their bodies.
- Arrange students in groups of three to four. Assign each group their own space in the room.
- Tell students that they will be making a dance phrase to demonstrate their understanding of the geometric concepts. Go over the requirements for dance phrase.
  - Provide time for students to brainstorm ideas for how to represent geometric concepts through movement.
  - Ask students to consider how they will transition from one movement to another. What type of energy will they use? Sustained, percussive, etc.
- After work time, all groups have a ‘dress rehearsal’ where students will simultaneously perform their dances.
- Invite groups that would like to perform, perform their dance for the whole class.
  - As students perform, ask the audience to identify angles, lines, line segments, rays, and points that they saw in the dance phrase.

Closing/Reflection

- Geometry exit ticket: Students write a journal entry that addresses one or more of the following prompts:
    - How did our group decide on the movements to represent angles, lines, line segments, rays, and points?
    - What challenges did we face while creating our dance phrase, and how did we overcome them?
    - Which was the easiest to illustrate through dance and why?
    - What did I learn about angles, lines, line segments, rays, and points through this lesson?
    - How did I use my body to represent angles, lines, line segments, rays, and points?
    - What was my favorite part of creating the dance phrase and why?

ASSESSMENTS

Formative
Teachers will assess student learning throughout the lesson by observing students during the activator to check for understanding of vocabulary and group check-ins during group work time.
Summative
Geometry Dance Phrase is assessed using the Geometry Dance Rubric.

DIFFERENTIATION

Accelerated:

- Students work individually or with a partner instead of a small group.
- Have students engage in the complete Engineering Design Process by brainstorming how to show geometric concepts through movement, planning for their choreography through sketches/descriptions, creating choreography, performing choreography for a partner group, getting feedback from the partner group, and revising their choreography.

Remedial:

- Reduce requirements of the dance phrase.
- Pair students with an accelerated student.

ADDITIONAL RESOURCES

CREDITS

U.S. Department of Education- STEM + the Art of Integrated Learning
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**This integrated lesson provides differentiated ideas and activities for educators that are aligned to a sampling of standards. Standards referenced at the time of publishing may differ based on each state's adoption of new standards.*

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