DANCING WITH SHAPES:
EXPLORING VOLUME THROUGH MOVEMENT
Grade Band: 9-12
Content Focus: Dance & Math

LEARNING DESCRIPTION

Students explore the concept of volume of composite shapes by solving problems and expressing their answers through dance. Students first calculate the volumes of composite three-dimensional figures composed of two or more individual shapes. After solving, they use the volume as the counts for a dance sequence, integrating basic dance elements. Students may also choose to have their movements reflect the shapes themselves, embodying prisms, cylinders, cones, and spheres in creative ways. The lesson promotes mathematical reasoning, collaboration, and kinesthetic learning by connecting geometry and artistic expression.

LEARNING TARGETS

Essential Questions	"I Can" Statements
How can we use dance and movement to illustrate the volume of composite shapes?	I can find the volume of composite three-dimensional shapes. I can create a dance that uses the calculated volume as counts.

	I can incorporate dance elements like space, energy, and time into my choreography. I can explain how my dance reflects the geometric concepts we studied.

GEORGIA STANDARDS

Curriculum Standards	Arts Standards
Geometry: G.GSR.9.1 Use volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems including right and oblique solids.	DHSMOD1.CR.1 Demonstrate an understanding of creative/choreographic principles, processes, and structures. DHSMOD1.PR.1 Identify and demonstrate movement elements, skills, and terminology in dance. DHSMOD1.PR.2 Understand and model dance etiquette as a classroom participant, performer, and observer. DHSMOD1.RE.1 Demonstrate critical and creative thinking in all aspects of dance. DHSMOD.CN.3 Demonstrate an understanding of dance as it relates to other areas of knowledge.

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
Geometry with Statistics Standards: GS.MGSR.1. Compute area and volume of figures by determining how the figure might be obtained from simpler figures by dissection and recombination. GS.MGSR.1.1 Apply area and volume formulas of two- and three-dimensional figures to solve real-world situations.	**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
• Composite shape — A shape made from two or more simple geometric shapes • Volume — The amount of space a three-dimensional figure occupies, measured in cubic units • Prism, cylinder, cone, sphere — Basic three-dimensional shapes	• Choreographer — The person who designs or creates a dance piece • Energy — How movement happens: sharp, smooth, suspended, swinging, vibratory • Space — Levels (high, middle, low), pathways, and shapes dancers make • Time — Beat, rhythm, and tempo • Choreography — The art of designing and arranging sequences of movements, steps, and gestures to create a dance piece

MATERIALS

- Projector/board for mini-lesson and examples
- Teacher generated geometry problem set with composite shapes
- Dance vocabulary terms for each student
- Paper and pencils for calculations and choreography notes
- Music (optional)
- Space for students to rehearse and perform dances

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

- Introduce the essential question and objectives.
- Conduct a quick mini-lesson reviewing the formulas for volume of individual shapes and strategies for calculating the volume of composite shapes.
- Review basic dance elements (energy, space, time) and discuss how they can reflect geometric ideas.
    - Example: a suspended leap could represent the top of a cone; sharp, angular movements could represent prisms.
    - Have students brainstorm ideas for how the dance elements could reflect geometric ideas.
- Call out dance elements from the Dance Vocabulary sheet, and students demonstrate.
    - Example: student travels around the room to demonstrate locomotor or shakes their whole body to demonstrate vibratory energy.

Work Session

- Students solve assigned problems to find the volumes of given composite shapes.
- Once students have the volume, they use it as the “counts” in their dance.
    - Example: A volume of 72 cubic units = a 72-count sequence
- In groups, students choreograph a dance using the following steps
    - Students decide on movements to fill their counts.
    - Students incorporate dance elements of energy, space, and time in their choreography.
        - Time: The number of counts in their sequence, the speed at which their movements are performed, etc.
        - Energy: Vibratory, suspended, etc.
        - Space: Body shapes (connect to geometric forms), levels, etc.
- As students plan, the teacher circulates and prompts as needed with the following questions:
    - What does your shape “look” like in motion?
    - How can you use levels (high, middle, low) to show your shape?
    - Can you make your movements sharp, smooth, or suspended to reflect your shape’s features?
    - How will you keep count to match your calculated volume?

Closing/Reflection

- Groups perform their dances for the class. Each group explains their choreography choices by answering the following questions:
    - How did you decide on movements?
    - How did your dance reflect the volume and/or the shapes?
    - Which dance element was most important in your choreography and why?
- Exit ticket: What did you learn about volume and composite shapes through dance?

ASSESSMENTS

Formative

- Observation of students’ calculations and group discussions.
- Participation in dance planning and performance.

Summative

- Accuracy of calculations
- Students’ connection of dance concepts to mathematical concepts

DIFFERENTIATION

Acceleration: Students can create a more complex sequence incorporating multiple shapes and counts.

Remediation: Provide step-by-step guides, example counts or allow simpler movements focusing on rhythm and counts.

ADDITIONAL RESOURCES

- Elements of Dance video

**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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