



artsNOW

Integrated learning solutions

DANCING MACHINES Grade Band: 4-5 Content Focus: Dance & Science



LEARNING DESCRIPTION

Explore a variety of basic techniques in dance and identify how these strategies can be integrated into the science curriculum. This activity allows students to explore simple machines through movement and create imaginative new machines through choreographic sequences and collaboration.

LEARNING TARGETS

Essential Questions	"I Can" Statements
How can movement be used to better understand simple machines?	<p>I can use movements to represent simple machines.</p> <p>I can create machines with a purpose using two or more simple machines.</p> <p>I can use movement to demonstrate my understanding of machines.</p>



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	I can explain the role energy plays in machines.
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GEORGIA STANDARDS

Curriculum Standards	Arts Standards
<p>Grade 4: S4P3. Obtain, evaluate, and communicate information about the relationship between balanced and unbalanced forces. c. Ask questions to identify and explain the uses of simple machines (lever, pulley, wedge, inclined plane, wheel and axle, and screw) and how forces are changed when simple machines are used to complete tasks.</p>	<p>Grade 4: ESD4.CR.1 Demonstrate an understanding of the choreographic process. ESD4.CR.2 Demonstrate an understanding of dance as a form of communication. ESD4.CN.3 Integrate dance into other areas of knowledge.</p>

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
<p>Grade 4: 4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object. 4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide. 4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.</p>	<p>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.</p>

KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
<ul style="list-style-type: none"> ● <u>Spiral</u> - A plane curve generated by a point rotating around a fixed point; a helix ● <u>Counterbalance</u> - To act against with an equal weight or force ● <u>Force</u> - Strength; power; energy; intensity 	<ul style="list-style-type: none"> ● <u>Body</u> - The physical instrument used by dancers to express movement, emotion, and artistry ● <u>Levels</u> - The height of the movement, which can be low (close to the ground), middle (midway), or high (elevated) ● <u>Directions</u> - The direction of movement, such as forward, backward, sideways,



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- Energy - The capacity to do work or produce change
- Kinetic Energy - The energy of a body or a system with respect to the motion of the body or particles in the system
- Potential Energy - The energy that an object possesses due to its position, state, or configuration

diagonal, up, and down

- Pathways - The patterns made in space, like straight, curved, zigzag, or circular
- Dynamics - The quality of movement, which can be smooth, sharp, sustained, percussive, swinging, or collapsing
- Tempo - The speed of movement, which can be fast, moderate, or slow
- Choreography - The art and practice of designing and arranging dance movements and sequences
- Movement phrase - A sequence of movements that are connected and form a coherent unit of motion, much like a sentence in language
- Locomotor - Movement that travels through space
- Non-locomotor - Movement that does not travel through space

MATERIALS

- Sound source and music

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

Classroom Tips: Clear desks to have an open space and be tolerant of noise and excitement, but set limits.

- Have students form a circle.
- Demonstrate the Name Game by stating your name while making a movement or gesture to accompany your name.
- The circle then collectively repeats your name and gesture. Continue with the next person stating his/her name and making a gesture. The circle repeats the new person's name and gesture. Then, starting with the person of origin, repeat all the names and gestures shared to that point. Continue until everyone in the circle is included.

Work Session



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- Tell students that using movement and dance, the class will create “machines” where each part is dependent on another for its movement.
- Next, introduce dance elements and movement qualities by practicing a typical call and response with students. Continue the call and response adding body movements.
 - Incorporate some of the aspects of the elements of dance/movement qualities such as levels, pathways, direction, changes in tempo, dynamics, etc. (e.g., shake your hands at a high level quickly, shake them at a low level slowly; twist at a high level, twist at a low level, etc.).
 - Debrief the different movements with students asking them how movement can represent meaning.
- Break students into six groups. Assign each group one of the simple machines (lever, pulley, wedge, inclined plane, wheel and axle, and screw). Have each group develop a movement to demonstrate the machine.
- Allow groups to teach the whole class the movement so that every group is using the same movements for each simple machine.
- Discuss energy with students.
 - Ask students how changing the speed of the simple machine’s movement relates to the energy of the machine.
 - Ask students to consider what would happen if two dancers performing their simple machines collided? What would happen to the energy?
- Tell students that in their groups, they will create a new machine combining at least two of the simple machines using the movements they just learned. Students will generate a name and job for their machine.
 - Students should first sketch out their machine.
 - Students will then create a short movement phrase, “The Dance Machine”, to represent how their machine works.
 - Students should use elements of dance and movement qualities in their choreography.
- Students will perform their dances for the class. Discuss audience etiquette with students prior to performances.
 - Audience members will identify which simple machines were used to create the new machine during the groups’ dance performances.
 - After performances, students should explain the purpose of their machine.

Closing/Reflection

- Debrief the lesson by discussing how the concept of energy was used in each machine and how potential energy was converted into kinetic energy in their machines.

ASSESSMENTS

Formative

Teachers will assess students’ understanding by observing students’ participation with group members to create a movement to represent the function of a simple machine, discussion of the role of energy, and ability to design and represent a new machine through movement.

Summative



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- Students can use movements to represent simple machines.
- Students can create machines with a purpose using two or more simple machines.
- Students can use movement to demonstrate their machines.
- Students can explain the role energy plays in machines.

DIFFERENTIATION

Acceleration:

- Provide certain movement qualities and elements of dance that students must include in their choreography.
- Students should create choreography that demonstrates interruptions to energy, such as a bolder in front of a wheel.
- Have students create a drawing of their machine and explain in written form how it functions using simple machines. Students should explain the role of energy.

Remediation: Rather than have each group develop their own machine, develop a machine together as a class. Each group can then decide how they want to show the machine through movement.

ADDITIONAL RESOURCES

NA

**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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ATLANTA BALLET

Centre for Dance Education

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