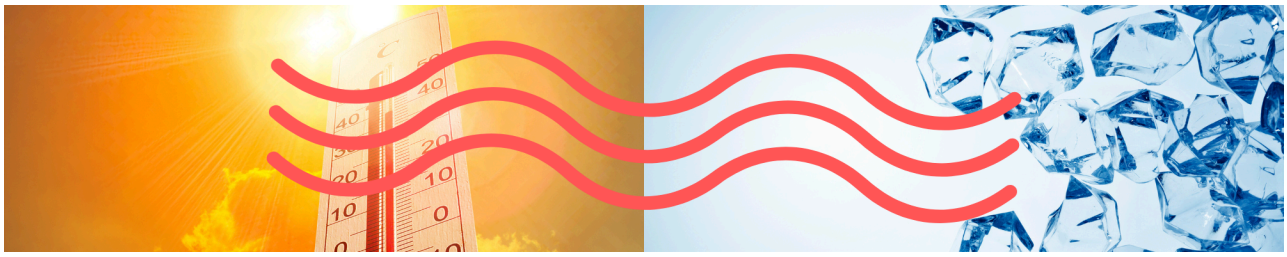
artsNOW
Integrated learning solutions

DANCE WITH HEATING, COOLING & INSULATION
Grade Band: 3-4
Content Focus: Dance & Science



LEARNING DESCRIPTION

In this lesson, help your students understand heating, cooling, and insulation by incorporating movement and dance composition.

LEARNING TARGETS

Essential Questions	"I Can" Statements
How can dance/movement help us understand and communicate how thermal energy can be transferred?	I can explain thermal energy transfer through the concepts of heating, cooling, and insulation. I can use movement qualities and energy to create choreography that appropriately demonstrates my assigned scenario. I can accurately match choreography and science concepts.

GEORGIA STANDARDS

Curriculum Standards	Arts Standards
Grade 3: S3P1. Obtain, evaluate, and communicate information about the ways heat energy is transferred and measured. a. Ask questions to identify sources of heat energy. (Clarification statement: Examples could include sunlight, friction, and burning.) b. Plan and carry out an investigation to gather data using thermometers to produce tables and charts that illustrate the effect of sunlight on various objects. (Clarification statement: The use of both Fahrenheit and Celsius temperature scales is expected.)	**Grade 3:** ESD3.CR.1 Demonstrate an understanding of the choreographic process. ESD3.CR.2 Demonstrate an understanding of dance as a form of communication. ESD3.PR.1 Identify and demonstrate movement elements, skills, and terminology in dance ESD3.RE.1 Demonstrate critical and creative thinking in dance.

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
Grade 4: 4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	**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
• Heating - The movement of thermal energy from one place to another • Cooling - The removal of heat from an object Insulation a material that reduces or prevents the transmission of heat or sound or electricity • Insulation - Reduces the transfer of heat between objects or environments	• Choreographer - A person who creates a dance • Level - One of the aspects of the movement element space; can be described as high, middle and low • Energy/Force - Force propels or initiates movement, or causes changes in

	movement of body position • Pathway - The designs traced on the floor as a dancer travels across space; the designs traced in the air as a dancer moves various body parts • Space - An element of movement involving direction, level, size, focus, and pathway • Movement phrase - A series of movements linked together to make a distinctive pattern • Non-locomotor - This refers to a movement that does not travel through space • Locomotor - This refers to a movement that travels through space • Steady beat - An unchanging, continuous pulse • Choreography - The art of composing dances and planning and arranging the movements, steps, and patterns of dancers • Shape - This refers to an interesting and interrelated arrangement of body parts of one dance; the visual makeup or molding of the body parts of a single dancer; the overall visible appearance of a group of dancers

MATERIALS

- Sound source and music with a steady beat
- Chart paper
- Markers
- Scenarios with heating, cooling and insulation

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

- Begin the lesson by engaging students in movement that introduces students to the Elements of Dance: Body, action, space, time and energy.
    - Have students arrange themselves in the classroom with enough personal space to move freely without touching a neighbor.
    - Turn on instrumental music with a steady beat.
    - First, have students bring awareness to their bodies by leading them through gentle stretches starting from the head and moving to the toes (e.g., head circles, shoulder shrugs, toe touches, etc.).
    - Next, bring students' awareness to the rhythm of the music by having them march in place to the beat with high knees, swinging their arms side to side.
    - Now, direct students to explore energy variations with different movement qualities such as sharp movements–quick, precise actions like punches or snaps, and smooth movements–slow, flowing actions like waves or circles with arms.
    - Finally, bring students' attention to levels (high, middle, low) and directions (forward, backward, sideways) with movements such as stretching up high and moving on tiptoes, moving low to the ground and crawling forwards and backwards, and bouncing in place at a medium level.
    - Have students return to their seats.

Work Session

- Begin with teacher-led discussion or review of science concepts of heating, cooling, and insulation.
- Divide students into small groups. Provide each group with a piece of chart paper/poster paper and markers.
- In their groups, students should divide their paper into two sections (or pre-divide students' paper for them).
    - Students should label the sections Heating and Cooling.
    - In each section, students should explain what heating and cooling are and provide examples of ways heat can be transferred or removed.
    - Allow students to share with the whole class. Students can revise/add to their charts as needed.
- Remind students of the movement qualities and energy variations that they explored from the warm-up.
    - Ask groups to discuss and list which types of movement qualities and energy would show heating and cooling.
        - For example, slow movements to quick movements might represent heating.
    - Facilitate a class discussion around student responses. Students should explain why certain movements and energy levels would communicate different concepts. Students can revise/add to their charts as needed.
- Provide each group with a different scenario involving heating, cooling and insulation.
- Ask students to interpret their scenarios through movement, focusing on energy types and movement qualities. Choreography should include a starting pose, three movements, and an ending pose.

Closing/Reflection

- The students will perform their movement phrases for their classmates. Discuss appropriate audience participation and etiquette prior to performances.
- Turn up the volume of the music and help students find the steady beat again by tapping their toe on the floor.
- After each performance, ask the audience to identify what happened in the scenario and whether it showed heating, cooling, or insulation. Ask groups to identify which movements in the choreography support their reasoning.

ASSESSMENTS

Formative
Teachers will assess students' understanding of the content throughout the lesson by observing students' participation in the activator; discussion of heating, cooling, and insulation; and group collaboration on brainstorming and creation of choreography.
Summative
CHECKLIST ● Students can explain thermal energy transfer through the concepts of heating, cooling, and insulation. ● Students can use movement qualities and energy to create choreography that appropriately demonstrates their assigned scenario. ● Students can accurately match choreography and science concepts.

DIFFERENTIATION

Acceleration: Challenge students to create their own scenario using an eight-count dance of either four two-count movements or eight one-count movements that shows both heating and cooling.

Remediation:

- Reduce the number of movements students are required to include in their choreography.
- Scaffold the lesson by creating choreography as a group for one of the concepts together before assigning individual groups scenarios to choreograph.

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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