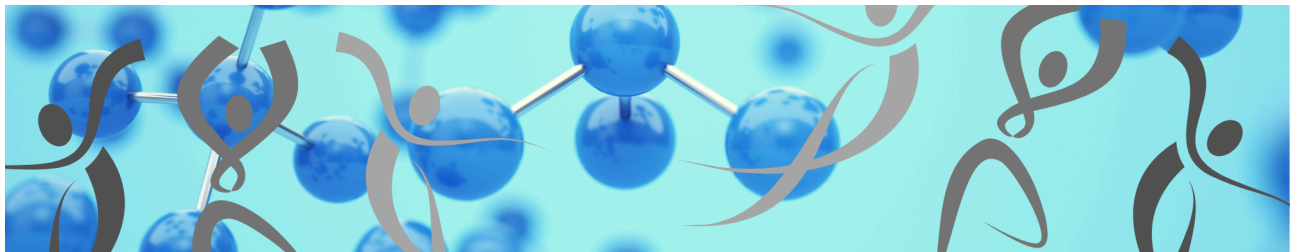




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Integrated learning solutions

STATES OF MATTER
Grade Band: 4-5
Content Focus: Dance & Science



LEARNING DESCRIPTION

In this lesson, you and your students will have fun moving and generating choreography to understand different states of matter. Emphasizing multiple learning styles will allow students to explore concepts in the way they learn most effectively.

LEARNING TARGETS

Essential Questions	"I Can" Statements
How can movement enhance comprehension of various states of matter?	I can choreograph a movement phrase that uses movement qualities, body shapes, and locomotor/non-locomotor movements to communicate the characteristics of atoms in the different states of matter. I can describe the three states of matter.



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	I can explain the correlation between heat and states of matter.
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GEORGIA STANDARDS

Curriculum Standards	Arts Standards
<p>Grade 4: S4E3. Obtain, evaluate, and communicate information to demonstrate the water cycle.</p> <p>a. Plan and carry out investigations to observe the flow of energy in water as it changes states from solid (ice) to liquid (water) to gas (water vapor) and changes from gas to liquid to solid.</p> <p>b. Develop models to illustrate multiple pathways water may take during the water cycle (evaporation, condensation, and precipitation).</p>	<p>Grade 4: ESD4.CR.1 Demonstrate an understanding of the choreographic process.</p> <p>ESD4.CR.2 Demonstrate an understanding of dance as a form of communication.</p> <p>ESD4.PR.1 Identify and demonstrate movement elements, skills, and terminology in dance</p> <p>ESD4.RE.1 Demonstrate critical and creative thinking in dance.</p>

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
<p>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.</p>	<p>Anchor Standard 1: I can use movement exploration to discover and create artistic ideas and works.</p> <p>Anchor Standard 2: I can choreograph a dance.</p> <p>Anchor Standard 3: I can perform movements using the dance elements.</p> <p>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>States of matter</u> - The distinct forms that different phases of matter take on • <u>Liquid</u> - Particles are close together but can move past one another, allowing liquids to flow and take the shape of their container while maintaining a 	<ul style="list-style-type: none"> • <u>Movement phrase</u> - A series of movements linked together to make a distinctive pattern • <u>Non-locomotor</u> - This refers to a movement that does not travel through space



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constant volume

- Solid - Particles are closely packed together in a fixed arrangement; solids have a definite shape and volume
- Gas - Particles are far apart and move freely; gasses have no definite shape or volume and will expand to fill their container
- Heat energy - Also known as thermal energy, is the energy that comes from the movement of particles within a substance; it is a form of kinetic energy due to the vibration and movement of atoms and molecules; the more these particles move, the higher the temperature and the more heat energy is present

- Locomotor - This refers to a movement that travels through space
- Sustained - A quality of movement that is smooth and unaccented; there is no apparent start or stop, only a continuity of energy
- Percussive - A quality of movement characterized by sharp starts and stops; staccato jabs of energy
- Vibratory - A quality of movement characterized by rapidly repeated bursts of percussive movements; like a jitter
- Swinging - A quality of movement established by a fall with gravity, a gain in momentum, a loss of momentum, and the repeated cycle of fall and recovery, like that of a pendulum
- Suspended - A quality of movement that occurs in a moment of resistance to gravity, such as the instant in which a dancer hangs in space at the top of a leap
- Tempo - The pace or speed of movement
- Choreography - The art of composing dances and planning and arranging the movements, steps, and patterns of dancers
- Choreographer - A person who creates dances
- 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



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- Sound source and music with a steady beat
- States of matter written on cards

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

Classroom Tips - You will need open space, so push desks/chairs to the side or go outside if that is an option.

- Have students form a circle.
- Begin the lesson by engaging students in movement that introduces students to the locomotor and non-locomotor movement.
- Have students arrange themselves in a circle 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.).
- Introduce non-locomotor movements to students by directing them in the following movements.
 - Bending and Stretching: Bend the knees and stretch up high.
 - Twisting: Twist the torso to the left and right.
 - Swinging: Swing the arms gently from side to side.
 - Swaying: Sway the body from side to side with feet planted.
 - Turning: Spin in place, both directions.
 - Invite students to create their own movement.
- Introduce non-locomotor movements to students by directing them in the following movements.
 - Walking: Walk around the room with different styles (tiptoeing, heel walking, big steps, small steps).
 - Jumping: Jump in place, then move forward and backward.
 - Invite students to create their own movement.
- Tell students that they will be playing the Name Game.
 - 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.
 - Debrief by asking students to identify examples of movements from the name game that were locomotor and non-locomotor.
 - Discuss movements in terms of movement qualities such as sustained, percussive, vibratory, swinging, and suspended.

Work Session



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- Divide students into small groups, assigning locomotor or non-locomotor movements to each group.
- Tell students to create a movement phrase using four movements. Students will perform for a partner group.
 - Ask students to identify the movement type (locomotor/non-locomotor) of their partner group.
- Discuss the three states of matter (solid, liquid and gas) and the effect that heat energy has on them.
 - Identify The speed (tempo) of atoms in each state and how the atoms move (movement quality, locomotor/non-locomotor and formations) in each state.
 - As you discuss each state of matter, ask students for ideas for how they could use movement to represent the atoms in each state.
 - Discuss and provide examples of movement qualities such as sustained, percussive, vibratory, swinging, and suspended.
- Assign each group two different states of matter (solid, liquid or gas).
- Tell students that they will create a movement phrase that will represent how atoms move in one state and then to the other state demonstrating understanding of both states of matter. Students should use movement qualities, body shapes, and locomotor/non-locomotor movements to demonstrate how atoms move.

Closing/Reflection

- Students will perform their movement phrases for their classmates. Discuss appropriate audience participation and etiquette prior to performances.
- After each performance, have audience members identify the group's two states, offering rationale for their identification.
- Discuss the correlation between heat and states of matter.

ASSESSMENTS

Formative

Teachers will assess students' understanding of the content throughout the lesson by observing students' participation in the activator, ability to identify the characteristics of the states of matter, and ability to work collaboratively to use movement to accurately and meaningfully represent the states of matter.

Summative

CHECKLIST

- Students can choreograph a movement phrase that uses movement qualities, body shapes, and locomotor/non-locomotor movements to communicate the characteristics of atoms in the different states of matter.
- Students can describe the three states of matter.
- Students can explain the correlation between heat and states of matter.

DIFFERENTIATION



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Acceleration:

- Discuss how creating dance is like writing a story in that both contain a beginning, middle, and end. This means that students' movement phrases would be more complex. Provide more guidelines for choreography (i.e., must be two minutes long, must have multiple level and spatial pattern changes, must select a particular dance style for choreography, etc.).
- Explore the five movement qualities of dance in greater depth: Sustained, swinging, suspended, vibratory, and percussive. Explore how these qualities aid in expression of mood/emotion of choreography.
- Create a Thinglink (via app or website) on the states of matter as individuals or in groups.

Remediation: Provide a graphic organizer with each state of matter in the first column, a section to write or draw characteristics of atoms in a second column, and a section to write movement qualities or types of movements that could be used to represent the state in the third column. Students can use the graphic organizer to assist them in their choreography.

ADDITIONAL RESOURCES

- BrainPop Jr.
 - Changing States of Matter, Educator Lesson Plan Guide available at: <http://educators.brainpop.com/lesson-plan/changing-states-of-matter-activities-for-kid>
 - Video viewable for schools with subscriptions at: <https://jr.brainpop.com/science/matter/changingstatesofmatter/>
- Scholastic Study Jams!
 - StudyJams! Solids, Liquids and Gases Teacher's Guide: <http://www.scholastic.com/teachers/lesson-plan/studyjams-solids-liquids-and-gases-teachers-guide>
 - Interactive Student Activity: <http://studyjams.scholastic.com/studyjams/jams/science/matter/solids-liquids-gases.htm>

**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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