UNIT: THE ART OF CHANGE–
A CHEMICAL AND PHYSICAL ADVENTURE
CHANGE IT…MOVE IT…
Grade Band: 5, 7
Content Focus: Dance & Science

LEARNING DESCRIPTION

In this arts-integrated lesson, students will explore the components of a movement sequence and apply their understanding to create a piece that expresses both physical and chemical changes. They will share their sequences with classmates and reflect on their creative process and insights gained throughout the experience.

LEARNING TARGETS

Essential Questions	"I Can" Statements
How can dance be used to create choreography that assesses students' understanding of what constitutes a physical change versus a chemical change?	I can work with a group to create a movement sequence that expresses a chemical and physical change.

How can we use movement and physical expression to represent the differences between chemical and physical changes?	

GEORGIA STANDARDS

Curriculum Standards	Arts Standards
Grade 5: S5P1. Obtain, evaluate, and communicate information to explain the differences between a physical change and a chemical change. a. Plan and carry out investigations of physical changes by manipulating, separating, and mixing dry and liquid materials. b. Construct an argument based on observations to support a claim that the physical changes in the state of water are due to temperature changes, which cause small particles that cannot be seen to move differently. c. Plan and carry out an investigation to determine if a chemical change occurred based on observable evidence (color, gas, temperature change, odor, new substance produced).	**Grade 5:** ESD5.CR.1.a Create shapes and levels through movement. ESD5.CR.1.b Create movement phrases with or without music. ESD5.CR.1.c Demonstrate knowledge of compositional elements through movement (e.g. beginning, middle, end, transitions).

SOUTH CAROLINA STANDARDS

Curriculum Standards	Arts Standards
Grade 7: 7-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	**Anchor Standard 1:** I can use movement exploration to discover and create artistic ideas and works. **Anchor Standard 2:** I can choreograph a dance.

KEY VOCABULARY

Content Vocabulary	Arts Vocabulary
• State of matter - The distinct forms that different phases of matter take on: Solid, liquid, gas and plasma • Physical change - A change from one state of matter to another without a	• Movement sequence - A series of movements; a short dance • Levels - One of the aspects of movement (there are three basic levels in dance:

change in chemical composition • Chemical change - A change that produces one or more new substances and may release energy • Substance - A type of matter that has a unique set of properties • Material - Relating to, derived from, or consisting of matter • Heat - The movement of thermal energy from one place to another • Reversible change - A change that can be undone; often called a physical or temporary change • Irreversible change - A process that is not reversible • Mixtures - A combination of two or more substances that can be separated by physical means • Compound - A substance made up of two or more elements that are chemically combined. For example, carbon dioxide is a compound that is chemically combined	high, middle, and low) • 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) • Locomotor movement - A movement that travels through space (e.g. walk, jump, hop, roll, gallop, skip, crawl & more) • Non-locomotor movement - A movement that does not travel through space (e.g. shaking, bending, stretching, twisting, turning & more)

MATERIALS

- Suggested Prompts for Chemical and Physical Changes
- Index cards
- Physical and Chemical Change Sequence

INSTRUCTIONAL DESIGN

Opening/Activating Strategy

• Have students demonstrate different sequences that you call out through movement (Incorporate levels, body shape, locomotor and nonlocomotor movements):
  ○ Straight shape, curved shape, angular shape
  ○ Shake low, shake high, shake low
  ○ Jump, jump, slide

- Gallup middle level, bend, hop
- Discuss that a sequence is a series of movements in an order.

Work Session

- Review elements of physical and chemical change.
- Divide students into groups of three to five.
- Review Prompts for Chemical and Physical Changes.
  - Each group will choose one prompt from the list that expresses:
    - A physical change
    - A chemical change
- For each selected change, the group will create a sequence that expresses that change with the following requirements:
  - A beginning, middle, and end
  - Three movements that clearly express the change
  - At least two levels (low, medium, and high)
  - At least one locomotor movement
  - At least one non-locomotor movement
- Groups should utilize the Physical and Chemical Change Sequence planning sheet to help plan their sequence.
- After a designated period of work time, each group will present their complete sequence for physical and chemical change. (If time is an issue, the teacher can designate which change should be presented.)

Closing/Reflection

- Students will reflect on one or more of the following questions:
  - How did your movements show the chemical or physical change? Use content and arts vocabulary.
  - How did engaging in the arts support and build upon your understanding of chemical and physical changes?
  - How did this activity help you understand chemical and physical changes in the world around you?
  - If you were to go through this artistic process again, what would you do differently? Why?

ASSESSMENTS

Formative

- Chemical and physical change sequence worksheet
- Check-in/observation of students during group creation of their sequence

Summative

- Performance of sequence–look for:
  - Three movements that clearly express the change (chemical or physical)
  - A beginning, middle, and end
  - At least two levels (low, medium, and high)
  - At least one locomotor movement

    - At least one non-locomotor movement
- Students can explain how their movements showed the chemical or physical change using content and arts vocabulary.

DIFFERENTIATION

Acceleration:

- Have students come up with their own examples of chemical and physical changes rather than use one of the prompts.
- Have students create props to accompany their choreography that would help explain the changes they are showing.
- Have students illustrate the changes that they showed through movement.

Remediation:

- Designate each group to focus on physical or chemical change.
- As a class designate which of the prompts are physical and chemical changes.

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.*