

Cause/Effect • Comparison (Compare and Contrast) • Change



Unit Essential Question

How can comparing and understanding physical and chemical changes help us to understand cause and effect in the world around us?

UNIT DESCRIPTION

Students will use theatre, music, movement, and the visual arts to observe, analyze and create physical and chemical changes. The unit's projects will lead students to making comparisons between physical and chemical changes and their various components. This unit and its projects will also focus on the cause and effect of the process of physical and chemical changes. Students will also strengthen their descriptive and opinion writing skills throughout the projects in this "Challenging Changes" unit. Roll up your sleeves and get ready to immerse in some engaging hands-on arts projects that will lead students to mastery of key science concepts and writing skills!

PROJECTS

- Project 1: Dance with Atoms
- Project 2: Thiebaud's Tasty Pastries
- Project 3: Rap Battles of Changes
- Project 4: Cooking Show with Mr. & Mrs. Changes



www.artsnowlearning.org

Units provide differentiated ideas and activities aligned to a sampling of standards. The units do not necessarily imply mastery of standards, but are intended to inspire and equip educators.

Produced through the U.S. Department of Education: Arts in Education—Model Development and Dissemination Grants Program
Cherokee County (GA) School District and ArtsNow, Inc.

Unit Description	Table of Contents
<p>Students will use theatre, music, movement, and the visual arts to observe, analyze and create physical and chemical changes. The unit’s projects will lead students to making comparisons between physical and chemical changes and their various components. This unit and its projects will also focus on the cause and effect of the process of physical and chemical changes. Students will also strengthen their descriptive and opinion writing skills throughout the projects in this “Challenging Changes” unit. Roll up your sleeves and get ready to immerse in some engaging hands-on arts projects that will lead students to mastery of key science concepts and writing skills!</p>	<ul style="list-style-type: none"> ● Dance with Atoms ● Thiebaud’s Tasty Pastries ● Rap Battles of Changes ● Cooking Show with Mr. & Mrs. Changes

UNIT ESSENTIAL QUESTION

- How can comparing and understanding physical and chemical changes help us to understand cause and effect in the world around us?

CROSS-CUTTING INTERDISCIPLINARY CONCEPTS

Cause/Effect
 Comparison (Compare and Contrast)
 Change

REAL WORLD CONTEXT

We study physical and chemical changes because they are in the world around us on a daily basis. We experience changes in matter in many aspects of our life, from the classroom to cooking dinner. Understanding these changes can help us develop day-to-day life skills, and inform ourselves of timely topics such as change and sustainability within our environment.

STANDARDS

Curriculum Standards	Arts Standards
<p>S5P2 Students will explain the difference between a physical change and a chemical change.</p> <p>a. Investigate physical changes by separating mixtures and manipulating (cutting, tearing, folding) paper to demonstrate examples of physical change.</p> <p>b. Recognize that the changes in states of water (water vapor/steam, liquid, ice) are due to temperature differences and are examples of physical change.</p> <p>c. Investigate the properties of a substance before, during, and after a chemical reaction to find evidence of change.</p>	<p>DSCO.4 Demonstrates an understanding of dance as it relates to other areas of knowledge.</p> <p>D5FD.1 Identifies and demonstrates movement elements, skills, and terminology in dance.</p> <p>c. Demonstrates accuracy, focus, control, and coordination in performing and creating a spectrum of locomotor sequences performed to music that includes a range of tempos, rhythms, and qualities.</p> <p>d. Performs smooth transitions when connecting movements.</p> <p>M5GM.4 Improvising melodies, variations, and accompaniments.</p>

CCSS-ELAW.5.2.a Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

ELACC5W3: Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

b. Use narrative techniques, such as dialogue, description, and pacing, to develop experiences and events or show the responses of characters to situations.

ELACC5W4 Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

ELACC5W5 With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.

ELACC5W6 With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.

ELACC5SL4 Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

a. Improvise rhythmic patterns using a variety of sound sources and answers to given rhythmic questions

M5GM.9 Understanding music in relation to history and culture.

a. Perform, listen, move, and/or distinguish between music from various historical periods and cultures from the Civil War to present (different genres).

VA5PR.3 Understands and applies media, techniques, and processes of three-dimensional works of art (e.g., ceramics, sculpture, crafts, mixed-media) using tools and materials in a safe and appropriate manner to develop skills.

b. Creates ceramic objects demonstrating refinement of the additive or subtractive method. (e.g., pinch method, coil method, relief) and techniques (e.g., score and slip, wedging, slab method, surface texture).

TAES5.3 Acting by developing, communicating, and sustaining roles within a variety of situations and environments.

a. Uses vocal elements such as inflection, pitch, and volume, to communicate the thoughts, emotions, and actions of a character.

e. Dramatizes literature and original scripts through various dramatic forms such as pantomime, process drama, puppetry, improvisation, plays, and readers' theatre.

TAES5.2 Developing scripts through improvisation and other theatrical methods.

a. Uses a playwriting process (e.g., pre-write/pre-play; prepare to write/plan dramatization; write; dramatize; reflect and edit; re-write/play; publish/perform).

c. Creates an organizing structure appropriate for purpose, audience and context.

TAES5.3 Acting by developing, communicating, and sustaining roles within a variety of situations and environments.

a. Uses vocal elements such as inflection, pitch, and volume, to communicate the thoughts, emotions, and actions of a character.

b. Uses body and stage movement to communicate the thoughts, emotions, and actions of a character.

c. Uses imagination to make artistic choices in portraying characters.

d. Collaborates with an ensemble to create theatre.

	e. Dramatizes literature and original scripts through various dramatic forms such as pantomime, process drama, puppetry, improvisation, plays, and reader's theatre.
--	--

ASSESSMENTS

Summative Assessments
<ul style="list-style-type: none"> ● Pre/Post Test ● Compare and Contrast Writing Rubric ● Narrative Writing Point of View Rubric ● Physical and Chemical Change Rap Battle Rubric ● Cooking Show Script and Performance Rubric

CHARACTER EDUCATION COMPONENTS

CHARACTER ATTRIBUTES

<p>In "Cooking with P&C Changes," the students will present their cooking show to a lower grade-level class. You could pair up your 5th grade class with a 2nd grade class learning "how-to" writing. The 5th grade students could perform their cooking show dramatizing the differences between physical and chemical changes. Then the 5th graders could be directed to assist the 2nd grade students with creating a "how-to" writing piece explaining how to make one of the recipes made on the "show."</p> <p>Also, in "Rap Battle," the topic of respect is brought up throughout the lesson. It is addressed because even though we are "battling," we still need to be respectful of each other and each other's ideas.</p>	<p>Respect Learning with others Being good listeners Kindness</p>
---	---

PARTNERING WITH FINE ARTS TEACHERS

<p>Music Teacher:</p> <ul style="list-style-type: none"> ● Providing musical instruments for "Rap Battle" project ● Providing examples of Found Sounds prior to students doing "Dancing with Atoms" project ● Differentiation ● Rhyme scheme and pattern (<u>ex.</u> ABAB) in music in "Rap Battle" project <p>Visual Arts Teacher:</p> <ul style="list-style-type: none"> ● Offer prints/lesson of Wayne Thiebaud Pastry Art (mini-lesson, or extension) <p>Dance Teacher:</p> <ul style="list-style-type: none"> ● Mini-lesson prior to "Dancing with Atoms" project to teach locomotor, non-locomotor, vibratory, etc. (or reinforce if already taught in the classroom)

APPENDIX (See Downloads)

<ul style="list-style-type: none"> ● Pre-test/Post-test
--

ADDITIONAL RESOURCES**Books**

- *Changing Matter: Understanding Physical and Chemical Changes* by Tracy Nelson Maurer
- *Make It change!* by Anna Claybourne
- *The Solid Truth about Matter* by Mark Weakland
- *Pancakes, Pancakes!* by Eric Carle

Websites

- Virtual Physical and Chemical Changes Lab:
<http://vital.cs.ohiou.edu/steamwebsite/downloads/ChangeLab.swf>
- Glencoe Publishing Virtual Physical and Chemical Changes Observations Lab:
http://www.glencoe.com/sites/common_assets/science/virtual_labs/E03/E03.html
- Sunday Morning Interview with Wayne Thiebaud:
https://www.youtube.com/watch?v=vl_QJ5D9Qm8-CBS

CREDITS

U.S. Department of Education

Arts in Education--Model Development and Dissemination Grants Program

Cherokee County (GA) School District and ArtsNow, Inc.

Ideas contributed and edited by:

Carol Steele, Taylor Stewart, Melissa Joy, Shannon Green, Dr. Maribeth Yoder-White, Jessica Espinoza

Name: _____ Date: _____

Changes in Matter Pre-/Post-Test

Write whether each change is a physical (P) or chemical (C) change.

1. Rust forming on a car _____
2. Ice Melting _____
3. Water freezing _____
4. Cutting a piece of paper _____
5. Burning firewood _____

6. Which of these is an example of a change in the **state of matter**?
 - a. Crumbling crackers into a bowl of soup
 - b. Letting an ice cube melt into a glass of water
 - c. Crushing a cube of sugar into a powder
 - d. Stirring salt into a glass of water

7. China heated water until it became a gas (water vapor). Which term identifies this change?
 - a. Condensing
 - b. Melting
 - c. Boiling
 - d. Freezing

8. Which of the following is NOT a physical change that happens when water changes state?
 - a. Water boils
 - b. Water freezes
 - c. Ice sinks
 - d. Ice melts

9. **TRUE or FALSE?** A color change is a clue that a chemical change has occurred.

10. Give an example of a physical change.

11. Give an example of a chemical change.

12. What kind of change is grinding chalk into a powder?

- a. Chemical
- b. Mixture
- c. Physical
- d. Reaction

13. When a REACTION has occurred, that usually means a _____ change has occurred.

14. Your teacher mixes together two liquids. Together, the two liquids bubble. You just witnessed a:

- a. Transfer of energy
- b. Physical reaction
- c. Chemical reaction
- d. Force

15. Which mixture could you best separate with a filter?

- a. Salt and pepper
- b. Rocks and wood chips
- c. Sugar and iron fillings
- d. Sand and rocks

16. Jason dissolved a spoonful of salt in a glass of water. How can Jason know that the salt has gone through a physical change and not a chemical change? Explain.

A pancake is a common breakfast food that is eaten after mixing various ingredients together.

Part A: Is the change that occurs when mixing together the pancake ingredients physical or chemical? Explain why.

Part B: Describe a change that could be made to the pancake and it still remain a pancake.

Part C: When we cook the pancake on the griddle, or stove, is it undergoing a physical or chemical change? Explain why.
