

# Unit 2: Changes in Matter

Content Area: **Science**  
Course(s):  
Time Period: **Generic Time Period**  
Length: **4 weeks**  
Status: **Published**

## Disciplinary Core Ideas

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### PS1.A: Structure and Properties of Matter □

The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2) □

### PS1.B: Chemical Reactions

When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4)

□

No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5-PS1-2)

## Standards

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	print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
LA.5.W.5.9	Draw evidence from literary or informational texts to support analysis, reflection, and research.
MA.K-12.2	Reason abstractly and quantitatively.
TECH.8.1.5.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
SCI.5-PS1-4	Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
MA.5.5.MD.A.1	Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.
TECH.8.1.5.F.CS2	Plan and manage activities to develop a solution or complete a project.
LA.5.W.5.7	Conduct short research projects that use several sources to build knowledge through investigation of different perspectives of a topic.
SCI.5-PS1-2	Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.
CAEP.9.2.8.B.1	Research careers within the 16 Career Clusters <sup>®</sup> and determine attributes of career success.
TECH.8.1.5.A.3	Use a graphic organizer to organize information about problem or issue.

## **Objectives and Essential Questions**

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### **Student Learning Objectives**

- A) Conduct an investigation to determine whether the mixing of two or more substances results in new substances.
- B) Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.

### **Essential Questions**

If I have a frozen water bottle that weighs 500mg, how much will it weigh when the water melts?

How can we make slime?

How can vinegar and baking soda burst a zip-lock bag?

## Concepts

### Part A

- Cause-and-effect relationships are routinely identified, tested, and used to explain change.
- When two or more different substances are mixed, a new substance with different properties may be formed.

### Part B

- Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.
- The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish.
- No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Note: Mass and weight are not distinguished at this grade level.)
- Science assumes consistent patterns in natural systems.

## Activities and Lessons

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### Mystery Science Explorations, Activities and Optional Extras

Mystery Science Chemical Magic Mystery 3 - What do fireworks, rubber, and silly putty have in common? (Chemical Reactions)

(5-PS1-4)

5th Grade NGSS Notebook

Chemical Change Clues

## Examples of Chemical Changes

### Describing Chemical Changes

(5-PS1-2)

#### Matter Bundle

Lesson 1 What are Chemical Reactions? + Activity

Lesson 2 Examples of Chemical Reactions + Activity

Lesson 3 Reacting Atoms and Molecules + Activity

#### Experiment Ideas

Making Slime (5-PS1-2)

Vinegar and Baking Soda Bursting Zip Lock Bag (5-PS1-2)

## **Materials and Resources**

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[www.mysteryscience.com](http://www.mysteryscience.com)

-Mystery Science Chemical Magic Mystery 3

-5th Grade NGSS Interactive Science Notebook

-NGSS Matter and It's Interactions Bundle

Youtube, Brainpop Videos

STEM experiments: <http://www.siemensstemday.com/educators/activities?g=5&sort=level&sortd=DESC>

NJ Model Curriculum Sample of Open Education Resources - Time For Slime! -

<https://www.acs.org/content/dam/acsorg/education/whatischemistry/adventuresinchemistry/experiments/timeforslime/slime-activity.pdf>

Bubble Burst! - [http://www.exploratorium.edu/science\\_explorer/bubblebomb.html](http://www.exploratorium.edu/science_explorer/bubblebomb.html)

Flame Out -

<https://www.acs.org/content/dam/acsorg/education/whatischemistry/adventuresinchemistry/experiments/flameout/flame-experiment.pdf>

## **Assessment**

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### Part A

Students who understand the concepts are able to:

- Identify, test, and use cause-and-effect relationships to explain change.
- Conduct an investigation collaboratively to produce data that can serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials is considered.
- Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

### Part B

Students who understand the concepts are able to:

- Measure and describe physical quantities such as weight, time, temperature, and volume.
- Measure and graph quantities such as weight to address scientific and engineering questions and problems.
- Measure and graph quantities to provide evidence that regardless of the type of change that occurs when substances are heated, cooled, or mixed, the total weight is conserved. (Note: Assessment does not include distinguishing between mass and weight.)
- Examples of reactions or changes could include: Phase changes, Dissolving, Mixing

Assessment Options

**-Mystery Science Assessment - Chemical Magic Assessments Tab**

**Mystery 3, Summative Assessment**

**-NGSS Mater Bundle**

**-NGSS 5th Grade Science Notebook**

## **Accommodations and Modifications**

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Group lab/experiment groups

Additional time for classwork

Additional time for assessments

Tests in small group

Use of videos and visual models

Preferential seating

Notes/outlines provided