# The Properties of Matter: It Matters!

<table>
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<tr>
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<tr>
<td>Grade Level</td>
<td>2</td>
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<tr>
<td>Duration</td>
<td>3 class periods</td>
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## National Standards

### GEOGRAPHY

**Element 5: Environment and Society**
14. How human actions modify the physical environment
15. How physical systems affect human systems

## AZ Standards

### ELA

**Reading**

- **Integration of Knowledge and Ideas**
  2.RI.7 Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.

**Writing**

- **Text Types and Purposes**
  2.W.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section.

### SCIENCE

#### NEXT GENERATION SCIENCE STANDARDS

**2. Structure and Properties of Matter**

- **PS1.A: Structure and Properties of Matter**
  Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1)

#### Production and Distribution of Writing

- **2.W.4** With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose.

#### Research to Build and Present Knowledge

- **2.W.8** Recall information from experiences or gather information from provided sources to answer a question.

### PHYSICAL SCIENCE STANDARDS

- **2.P1U1.1** Plan and carry out an investigation to determine that matter has mass, takes up space, and is recognized by its observable properties; use the collected evidence to develop and support an explanation.

## SIOP Elements

### Preparation

- Adapting content
- Linking to background
- Linking to past learning

### Scaffolding

- Modeling
- Guided practice
- Independent practice
- Comprehensible input

### Grouping Option

- Whole class
- Small groups
- Partners
- Independent
Overview

All things in the world are made up of matter. In everyday life, young students will observe the world around them and can learn to recognize the 3 types of matter—their properties and how they change.

Purpose

In this lesson students will determine the properties of the 3 states of matter (solid, liquid, gas). They will conduct experiments and make observations that will help them to determine the properties of each type of matter and how matter can change. Students then will apply their learning to solve community problems.

Key Vocabulary

**matter:** anything that takes up space and has weight

There are 3 main types of matter.

**properties:** how you describe something, its characteristics

**atoms:** tiny, little building blocks that make up matter and are too tiny to see

**solid:** an object that keeps its shape at a certain temperature

**liquid:** matter that flows and takes the shape of the object that it is poured into

**gas:** an air-like substance that moves around all the time

Materials

- Vocabulary Cards
- Projection device, computer, internet
- Science journal
- 3 States of Matter Sort worksheet
- Fingers Tell poem
- Describing Properties graphic organizer
- Magnifying glasses
The Properties of Matter: It Matters!

- Collection of everyday objects to observe: pipe cleaners, water in a container, marbles, sandpaper, liquid soap, cottonballs, rocks, filled balloons, etc.
- Images of Flooding and Stinky Air
- Solving Problems in Our Community
- Scoring Guide for Opinion Paper
- Vocabulary Test and Answer Key

Objectives
The student will be able to:

1. Define matter.
2. Recognize matter by its properties.
3. Use evidence to support an opinion.
4. Solve community problems.

Procedures

SESSION ONE

Engage:
1. Begin the lesson by asking, “If you were to meet an alien from another world, and it asked you what your world is made of, what would you say?”
2. Give students time to think and write down their thoughts in a Quick Write entitled Conversation with a Space Alien. Students may use a Sentence Starter: What I would say to an alien is ______ or Our world is made of ______.
3. Have students take turns and share their responses. Record answers on chart paper or whiteboard. (Preparation: Linking to past learning; Application: Promotes engagement)
4. Then ask: Which explanation would you agree with the most? Why? Circle or highlight the 2-3 claims most agreed with.
5. Now focus on those several claims and ask students to consider these ideas:
   - Is that claim reasonable?
   - Can you give a real world example?
   - What is the difference between it and _____ (ex.: air or wood)?
   - Are there categories of things the world is made of?
   - What do you observe about stuff? (Application: Promotes engagement, Linked to objectives)
6. Project the Vocabulary Cards. Explain each card and post the cards on the word wall. Have students write the definitions and draw examples in their science journal. (Scaffolding: Comprehensible input)

SESSION TWO:

9. Distribute and project the 3 States of Matter Sort worksheet. Have students look at their examples found during the Scavenger Hunt and list them under the proper heading. Then have students share their findings and allow students to add to their original observations. Monitor to make sure liquids are under the liquid column, etc.
10. Have students do the 3 questions at the bottom and discuss their answers. (Integrating Processes: Reading, Writing)
11. Project and read the poem: Fingers Tell. Ask the students if all of the liquids were exactly alike. Were all of the solids alike? Explain why it would be hard to know if all of the gases were alike. (Scaffolding: Comprehensible input; Integrating Process: Reading)
12. Have them draw the conclusion that matter has different properties. Refer them back to the Vocabulary Card for properties.

Explain:
13. Distribute and project the Describing Properties graphic organizer. Use an object not listed (apple, stapler, ruler) and model how to fill in the graphic organizer.
14. Distribute magnifying glasses and have them examine something on their desk. Ask for them to describe what they are seeing using as much scientific/descriptive language as they can. (Application: Hands on, Promotes engagement)
15. Distribute the collection of everyday objects to observe and have students work in pairs to complete their observations on the graphic organizer. (Grouping Option: Partners)

Elaborate:
16. Distribute the Problems in Our Community worksheet. Explain that knowing the properties of matter can be used to solve problems. Show the Images for Flooding. Ask students to describe what they are seeing. Then have them answer Problem 1 and draw their illustration.

17. Show the Images for Stinky Air. Ask students to describe what they are seeing. Then have them answer Problem 2 and draw their illustration. (Application: Promotes engagement; Scaffolding: Independent practice)

SESSION THREE
Prior to this session, print off as many assessment sheets in proportion to the number of items you plan to give them in procedure 18.

Evaluate:

18. Distribute the Properties of Matter Assessment (A) worksheet. Give students 3-6 solid, liquid, or gas objects or images. Have students identify the state of matter of each object/image.

19. Distribute the Properties of Matter Assessment (B) worksheet. Project the 4 images (tiger, waterfall, ocean, hot air balloons). Have students describe 3 properties of each and its state of matter.

20. Give each student a different image or object. Have them write an opinion paper on what state of matter each object should be categorized based on its properties. (Assessment: Written, Individual)

Assessment

Social Sciences, Science, and ELA
The Solving Problems in Our Community worksheet can be graded for accuracy. Mastery will be considered a score of 90% or higher.

Science
The 3 States of Matter Sort worksheet can be graded for accuracy. Mastery will be considered a score of 85% or higher.

The Describing Properties worksheet can be graded for accuracy. Mastery will be considered a score of 85% or higher.

Properties of Matter Assessments (A) and (B) can be graded for correct identification of state of matter and appropriate properties. Mastery will be considered a score of 80% or higher.

Science and ELA
The opinion paper can be graded using the Scoring Guide for Opinion Paper. Mastery will be considered a score of 24 points or higher.

The Vocabulary Test can be given to measure language acquisition. Mastery will be considered a score of 80% or higher.

Extensions

1. Use a hula hoop to create an area outdoors to observe states of matter and changes in matter over time. Students can observe and describe properties within that area and observe and record any changes throughout the week or month.

2. Have students record which states of matter they most observed throughout the day/week. Watch Changing Water-States of Matter YouTube video (5.08 min) https://www.youtube.com/watch?v=tuE1LePDZ4Y

3. Take a virtual field trip to a National Park. Grand Canyon is a great example of water changing the shape of the earth. There are 8 different videos. https://www.nps.gov/grca/index.htm

4. Disaster Challenge: Give students different disaster scenarios in which students are to construct a shelter using different materials. They must explain what properties do these materials have that would make you want to use them.

Sources


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