

The Properties of Matter: It Matters!

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Grade Level	2
Duration	3 class periods

National Standards

GEOGRAPHY

Element 5: Environment and Society

14. How human actions modify the physical environment

15. How physical systems affect human systems

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)

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.

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.

SCIENCE

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.

Arizona Social Science Standards

GEOGRAPHY

Human-environment interactions are essential aspects of human life in all societies.

2.G2.2 Describe how human activities affect the communities and the environment of places or regions.

CIVICS

Process, rules, and laws direct how individuals are governed and how society addresses problems.

2.C4.1 Explain how people work together to identify and solve problems within our world.

SIOP Elements

Preparation

Adapting content

Linking to background

Linking to past learning

Strategies used

Scaffolding

Modeling

Guided practice

Independent practice

Comprehensible input

Grouping Option

Whole class

Small groups

Partners

Independent

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Integrating Processes Reading Writing Speaking Listening	Application Hands on Meaningful Linked to objectives Promotes engagement	Assessment Individual Group Written Oral
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Arizona English Language Proficiency Standards

Grade 2-3

Basic

Listening and Reading

Standard 1 By the end of each language proficiency level, an English learner can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing.

B-1: ask and answer questions by using evidence from a text.

B-3: identify key details that support the main idea or message.

Speaking and Writing

Standard 4 By the end of each language proficiency level, an English learner can construct grade appropriate oral and written claims and support them with reasoning and evidence.

B-1 express an opinion on a topic or text.

B-2: supply a reason that supports the opinion and is based on some textual evidence.

B-3: use grade-appropriate words and phrases, including frequently occurring adjectives and adverbs.

B-4: provide a concluding statement to an opinion.

Listening, Speaking, Reading, and Writing

Standard 6 By the end of each language proficiency level, an English learner can participate in grade-appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.

B-1: participate in discussions about familiar topics and texts.

Standard 8 By the end of each language proficiency level, an English learner can analyze and critique the arguments of others orally and in writing.

B-3: use general academic and domain-specific words and phrases.

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

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- Collection of everyday objects to observe: pipe cleaners, water in a container, marbles, porcupine balls, feathers, 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**)

7. In their science journal have students write a conclusion: The world is made up of MATTER or stuff. This stuff can be sorted (categorized into SOLIDS, LIQUIDS, and GAS.) Matter is made up of ATOMS. (**Integrating Processes: Listening and Writing**)

Explore:

8. Conduct a Scavenger Hunt by allowing students to find examples of the 3 types of matter in the classroom or go outside and record their observations. This can be done as individuals or in pairs. (**Grouping Option: Partners; Scaffolding: Independent practice**)

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:

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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

McKraken Schools in Missouri:
[Structure and Properties of Matter 2nd grade Teacher's Guide](http://www.mccracken.kyschools.us)
<http://www.mccracken.kyschools.us>

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