

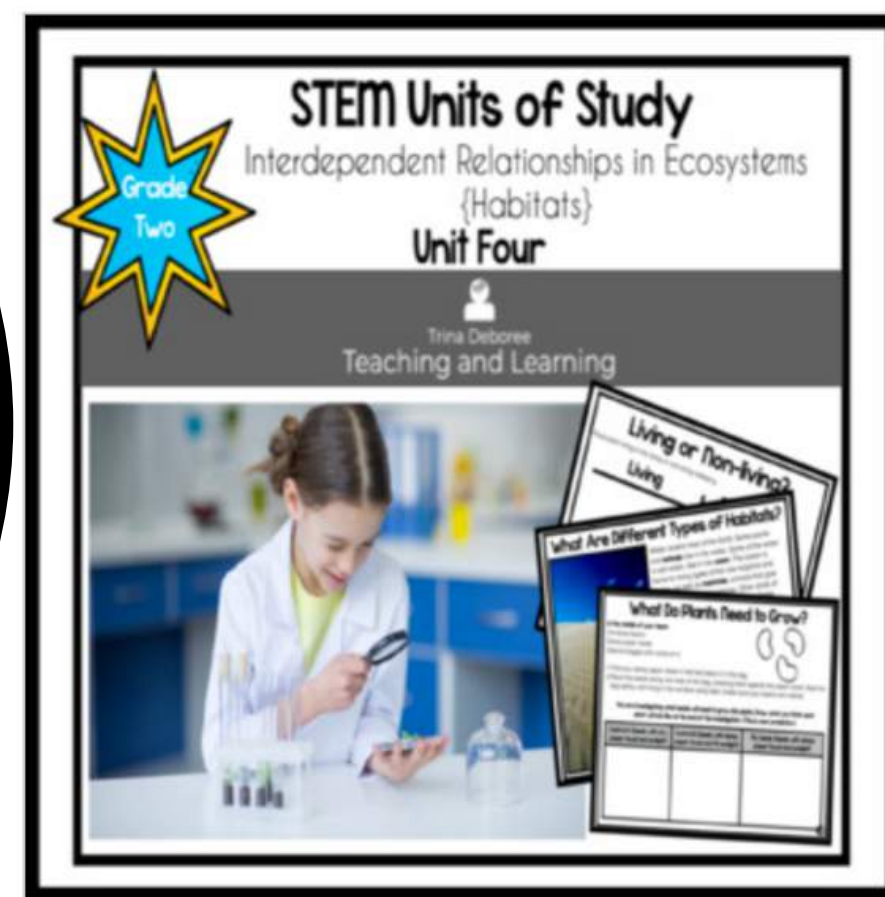
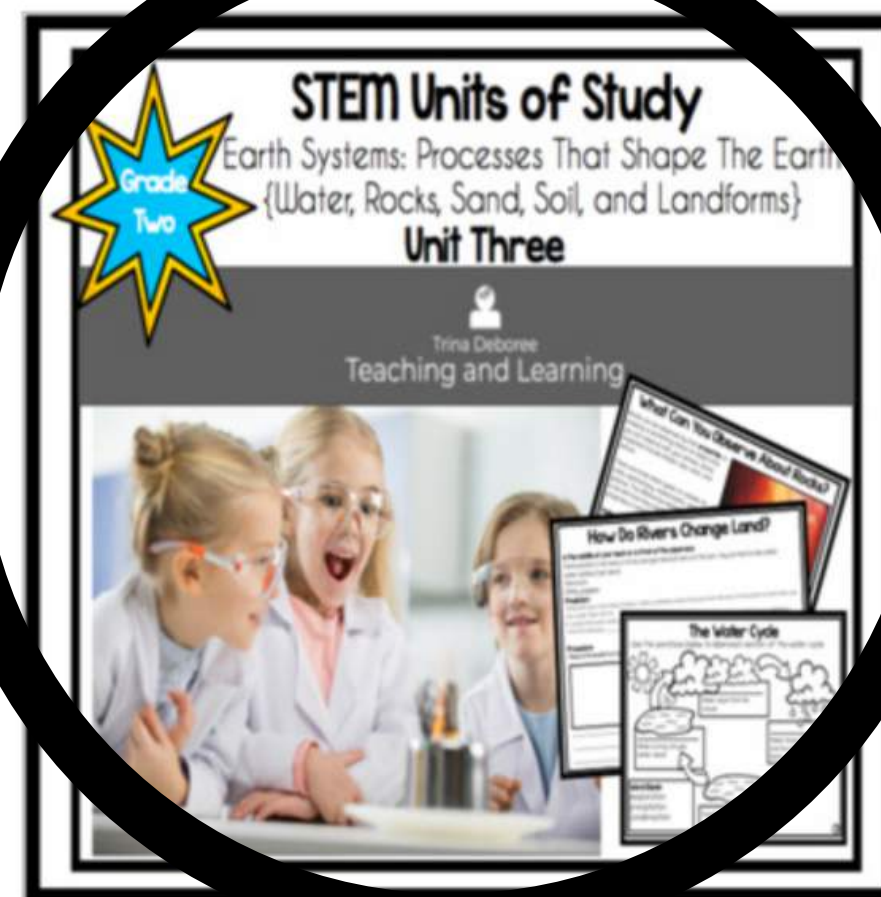
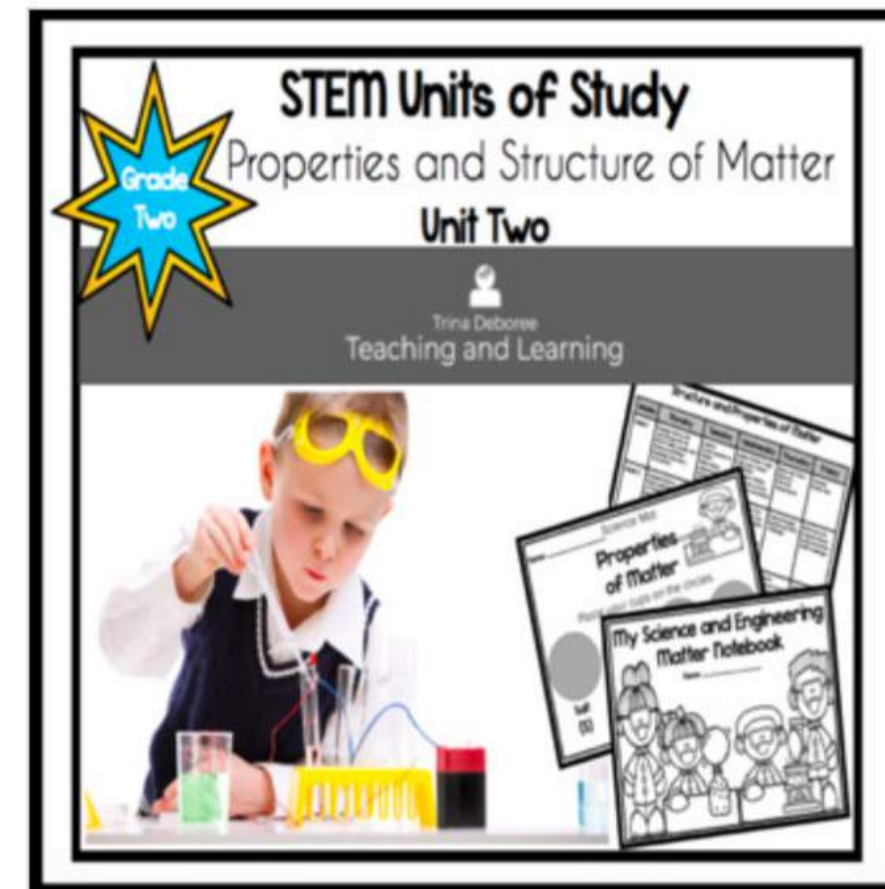
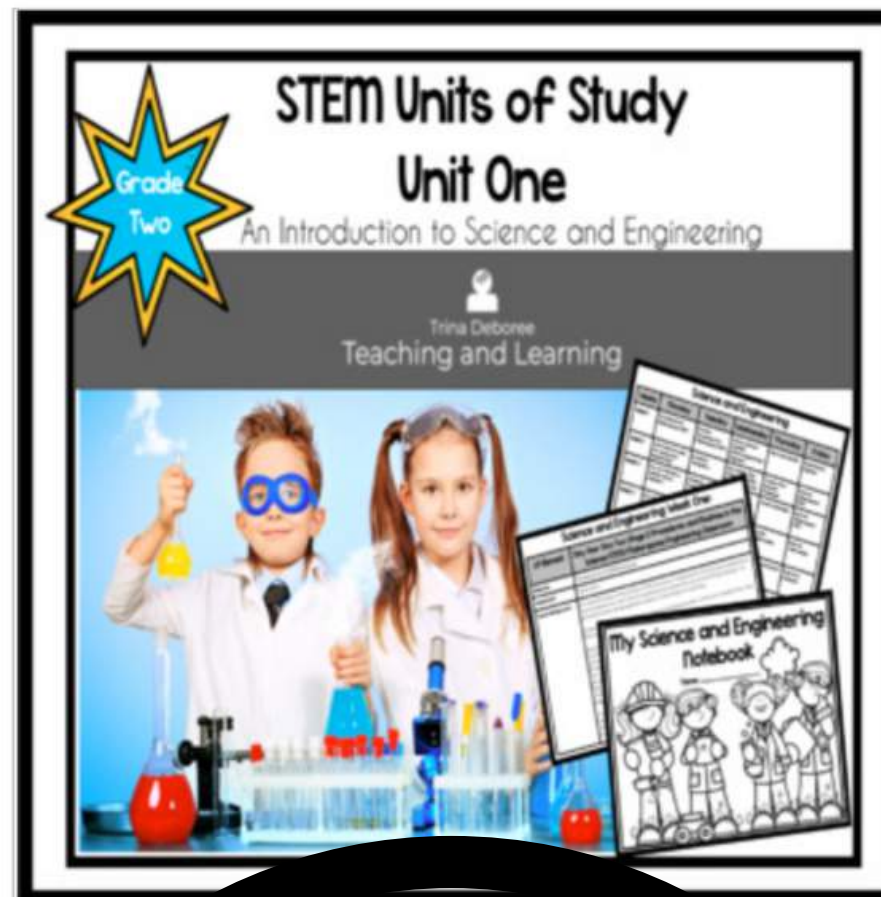
Complete STEM Unit on Matter

- ✓ Complete Yearly Pacing Guide
- ✓ 25 Lesson Plans
- ✓ 6 Science Investigations
- ✓ 1 STEM/Makerspace Challenges
- ✓ 11 Original Nonfiction Text Passages & Readers
- ✓ 10 Assessments (9 Formative & 1 Summative)
- ✓ Student Notebook
- ✓ Literature (Story Books) and Nonfiction Used
- ✓ Standards-Based
- ✓ Technology Integration



STEM Units Across the Year for Second Grade

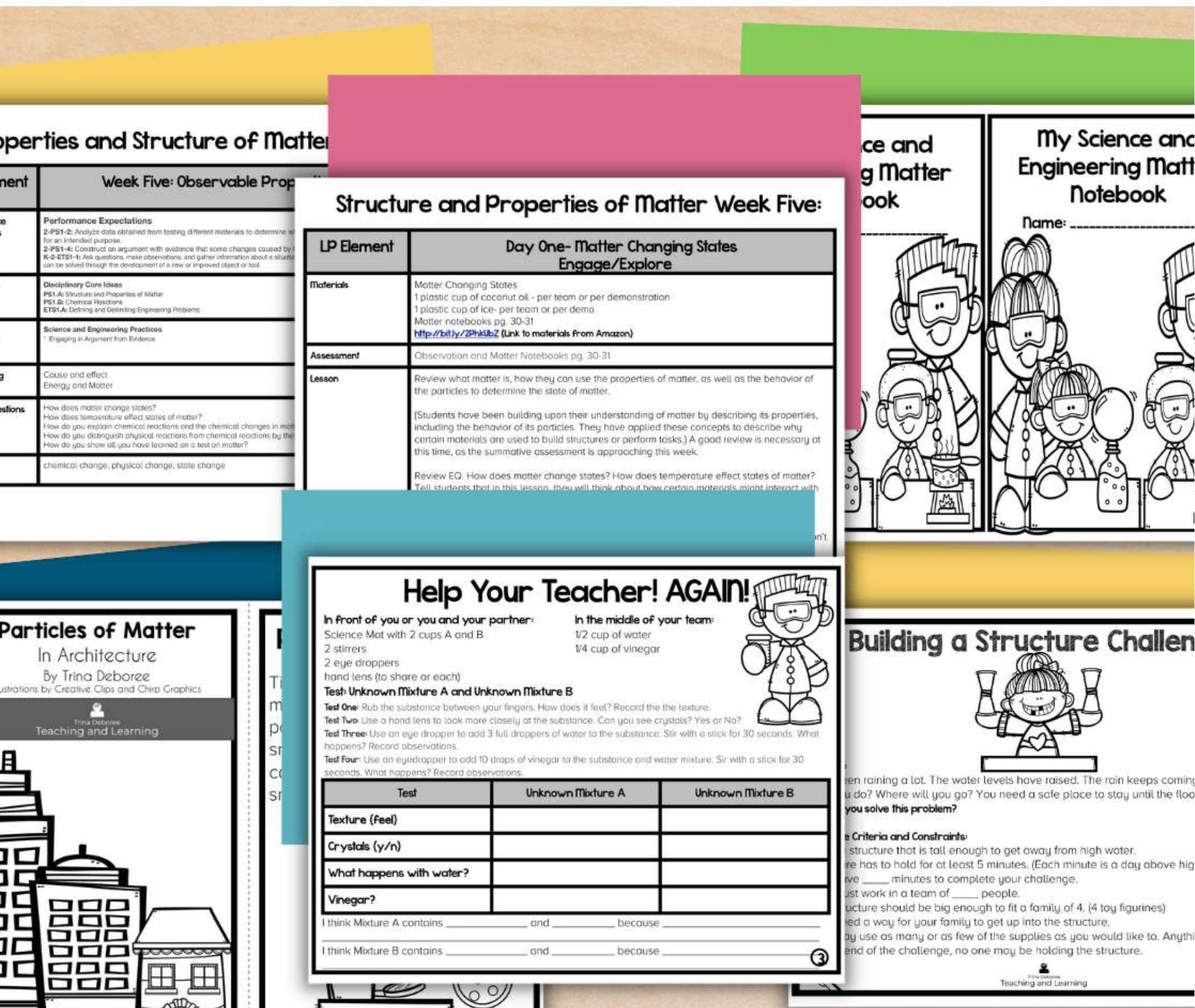
Save 50%



What Teachers are Saying...

In That Room (TpT Seller)

"This is so incredibly thorough! I could not ask for better directions and information. It was easy to write plans with and each experiment is well thought out and clearly hits the mark. I will be purchasing more units in the future!"



Take a closer Look!

25 Lesson Plans

Structure and Properties of Matter Week Five:

LP Element	Day One- Matter Changing States
Materials	<p>Materials listed</p> <p>1 plastic cup of coconut oil- per team or per demonstration 1 plastic cup of ice- per team or per demo Matter notebooks pg. 30-31 http://bit.ly/2PhkUbZ (Link to materials from Amazon)</p>
Assessment	<p>Assessment Included</p>
Lesson	<p>Lesson background provided for teacher</p> <p>...of matter, as well as the behavior of the particles to determine the state of matter.</p> <p>...in their understanding of matter by describing its properties, ...les. They have applied these concepts to describe why ...d structures or perform tasks.] A good review is necessary at ...sment is approaching this week.</p> <p>...nge states? How does temperature effect states of matter? ...ey will think about how certain materials might interact with ...they will look at how temperature effects the physical ...changes of matter.</p> <p>...m to carry the cups by the rim. You don't ...t to warm the coconut oil.</p> <p>...stance. Fill in the chart on page 31. Draw ...of matter.</p>

Lesson Contains:

- Essential Questions
- 5 E Model
- High Engagement Strategy
- Final Review

**Created for 30-40
Min. Time Blocks**

Take a closer Look!

Student Notebook Sample

My Science and Engineering Matter Notebook

Name: _____

My Science and Engineering Matter Notebook

Name: _____

Record thinking

Help Your Teacher! She's in Trouble!

In front of you or you and your partner:
 Science Mat with 4 empty cups
 2 stirrers
 2 eye droppers
 hand lens

Test: Salt (S), Cornstarch (C), White sand (WS), and Baking soda (BS)

Test One: Rub the substance between your fingers. How does it feel? Record the texture.

Test Two: Use a hand lens to look more closely at the substance. Can you see crystals? Put a check in the box if you can see crystals.

Test Three: Use an eye dropper to add 3 full droppers of water to the substance. Stir with a stick for 30 seconds. What happens? Record observations.

Test Four: Use an eyedropper to add 10 drops of vinegar to the substance and water mixture. Stir with a stick for 30 seconds. What happens? Record observations.

In the middle of your team:
 1/2 cup of water
 1/4 cup of vinegar

Label each cup:
 (S) for salt
 (C) for cornstarch
 (WS) for white sand
 (BS) for baking soda

Test	Salt (S)	Cornstarch (C)	White Sand (WS)	Baking Soda (BS)
Texture (feel)				
Crystals (y/n)				
What happens				

Nonfiction included

Matter Vocabulary

Word	Meaning	Examples from the text	Examples From the Activity
	Anything that has weight and takes up space		
	Matter that holds its size and shape		
	Matter that is wet and takes the shape of its container		
	Matter that has no shape and spreads out to fill a space		
	To mix a substance until you can't see it		

How Can You Observe and Measure Properties of Matter?

Matter can be observed and measured by its properties. **Properties** are something about an object that you can observe with your **senses**.

There are many properties that you can observe. Some of the properties that you can observe are **texture** (how something feels), whether an object sinks or floats, the color, and the shape.

Measuring properties includes size or length, the weight, **volume** (how much space matter takes up), and **temperature** (how hot or cold something is). These properties need some tool in which to measure.

Questions:

1. What does the word volume mean? _____
2. What text evidence supports the idea that the properties of matter can be observed and measured? _____
3. Why did the author most likely write "How Can You Observe and Measure Properties of Matter?" _____

Big Ideas!

Create a visualization of each big idea.

Everything around us is matter, and all matter takes up space.

We can find out about matter by using our senses.

Matter can come in different forms.

How Does Matter Change?

Some solids can change when they are mixed with water or other liquids. Sometimes when we mix solids with liquids, they become a solution. Sometimes the temperature helps a solid mix with a liquid to become a **solution**.

Some solids do not **dissolve** in liquid. Sand, a solid with very small particles, does not dissolve in water. Sand and water do not become a solution. Two parts remain separate even in the same container.

Solid matter can also change shape. All matter does not change in the same way. Some matter can be bent, folded, cut, chipped, broken, or torn. You can fold paper to write a note. You can also break candy to share a piece with your sibling or friend.

Questions:

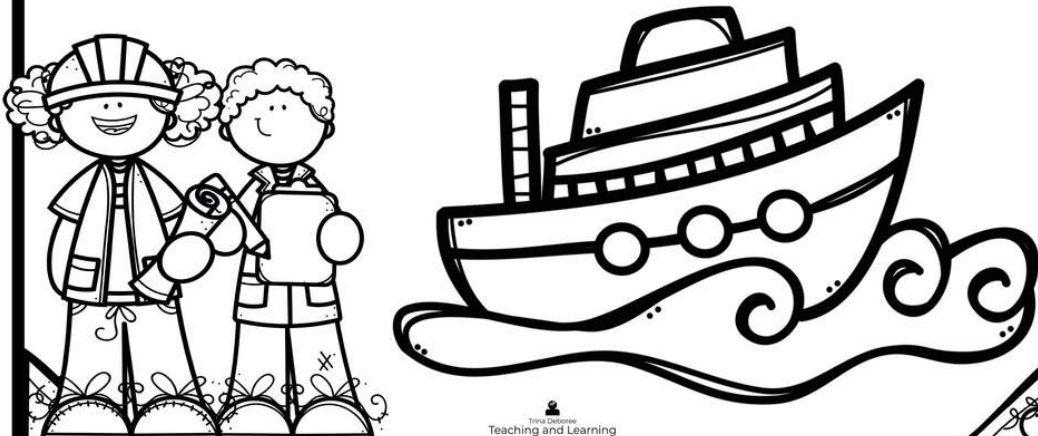
1. How do you change the state of solids? (Be sure to support your answer with evidence from the text.) _____
2. Why would someone want to change the state of matter? _____
3. What is a solution? _____

Take a closer Look!

2 STEM Challenges/Makerspace

Building My Boat Challenge

Name: _____



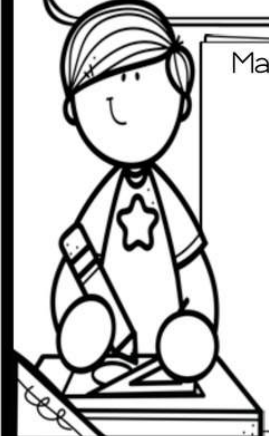
Teaching and Learning

Imagine My Solution

My Plan For Making My Solution

Materials Needed:

How will the construction work?




Reflect Upon and Improve My Solution

All About My Solution

The Problem My Solution Solved

How Did It Go?




Ask My Questions


Engineers and scientists ask lots of questions. They also try to answer questions. Think about your problem. Now think like a scientist and an engineer.

1. What can I create to solve the problem?

2. What do I need to know about solids and liquids?



Building a Structure Challenge




Problem:
It has been raining a lot. The water levels have raised. The rain keeps coming. What ever shall you do? Where will you go? You need a safe place to stay until the flooding stops.
How will you solve this problem?

Challenge Criteria and Constraints:
* Build a structure that is tall enough to get away from high water.
at least 5 minutes. (Each minute is a day above high waters.) to complete your challenge.
n of ____ people.
big enough to fit a family of 4. (4 toy figurines)
or family to get up into the structure.
or as few of the supplies as you would like to. Anything goes.
nge, no one may be holding the structure.

Teaching and Learning

Building My Structure Challenge

Name: _____



Simple Materials Needed

Close-Up Look at STEM Challenge

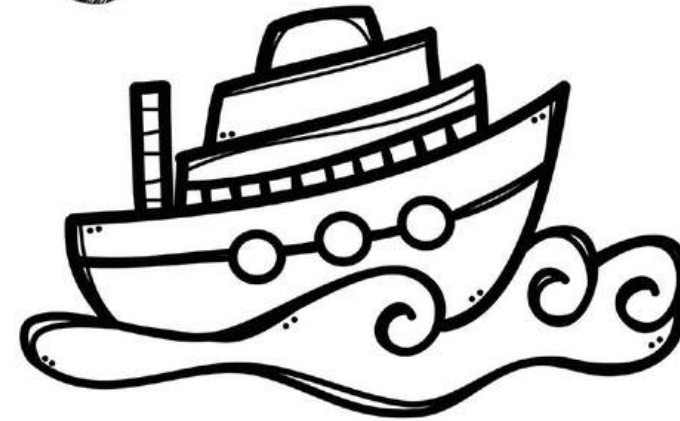
Problem

Challenge Criteria
& Constraints

Think Sheets

Work Through
Engineering Design
Process

Building a Boat Challenge



Problem:

You are stranded on a desert island. You are running out of food on your island. You need to get yourself and 5 other people across a large body of water (with sharks) to another island with more food. **How will you solve this problem?**

Challenge Criteria and Constraints:

- * Build a model of a boat for at least 5 toy figurines.
- * Boat has to hold float for at least 10 minutes with **no** sinking.
- * You have ____ minutes to complete your challenge.
- * You must work in a team of ____ people.
- * The water needs to hold weight and stay afloat.
- * Your boat needs room for at least 5 toy figurines to stand freely.
- * You may use as many or as few of the supplies as you would like to, but no additional items can be used.
- * At the end of the challenge, no one may be touching the boat, and it must float in the water.

↓ More

Take a closer Look!

7 Experiments and Explorations

Help Your Teacher! She's in Trouble!

In front of you or you and your partner:
 Science Mat with 4 empty cups
 2 stirrers
 2 eye droppers
 hand lens

In the middle of your team:
 1/2 cup of water
 1/4 cup of vinegar

Label each cup:
 (S) for salt
 (C) for cornstarch
 (WS) for white sand
 (BS) for baking soda

Test: Salt (S), Cornstarch (C), White sand (WS), and Baking soda (BS)
Test One: Rub the substance between your fingers. How does it feel? Record the texture.
Test Two: Use a hand lens to look more closely at the substance. Can you see crystals? Put a check in the box if you can see crystals.
Test Three: Use an eye dropper to add 3 full droppers of water to the substance. Stir with a stick for 30 seconds. What happens? Record observations.
Test Four: Use an eyedropper to add 10 drops of vinegar to the substance and water mixture. Stir with a stick for 30 seconds. What happens? Record observations.

Test	Salt (S)	Cornstarch (C)	White Sand (WS)	Baking Soda (BS)
Texture (feel)				
Crystals (y/n)				
What happens with water?				
Vinegar?				

Help Your Teacher! AGAIN!

In front of you or you and your partner:
 Science Mat with 2 cups A and B
 2 stirrers
 2 eye droppers
 hand lens (to share or each)

In the middle of your team:
 1/2 cup of water
 1/4 cup of vinegar

Test: Unknown Mixture A and Unknown Mixture B
Test One: Rub the substance between your fingers. How does it feel? Record the texture.
Test Two: Use a hand lens to look more closely at the substance. Can you see crystals? Yes or No?
Test Three: Use an eye dropper to add 3 full droppers of water to the substance. Stir with a stick for 30 seconds. What happens? Record observations.
Test Four: Use an eyedropper to add 10 drops of vinegar to the substance and water mixture. Stir with a stick for 30 seconds. What happens? Record observations.

Test	Unknown Mixture A	Unknown Mixture B
Texture (feel)		
Crystals (y/n)		
What happens with water?		
Vinegar?		

I think Mixture A contains _____ and _____ because _____
 I think Mixture B contains _____ and _____ because _____

Name: _____ Science Mat

Properties of Matter

Place your cups on the circles.

Salt {S} Cornstarch {CS} White Sand {WS} Baking Soda {BS}

Exploring Matter

Investigating Solids, Liquids, and Gases

What can you observe and infer about what is inside the bags?

Materials:
 * 3 treat bags (plastic, or felt bags work best) (with 3 balloons inside) labeled A, B, C
 * 3 plastic cups labeled A,B,C
 * Scissors

Steps:
Step One: Gently squeeze bag A to feel what is inside. Record your answer in the table below.
Step Two: Repeat Step One with bag B and bag C.
Step Three: Infer from your observations whether the materials in each balloon is a solid, liquid, or a gas. Write your inferences in the table.
Step Four: Place Cup A, Cup B, and Cup C in front of you.
Step Five: Pull out the balloons from the bags. Cut off the top of each balloon and pour the materials in each balloon into the cup with the same label.
Step Six: Observe the materials in each cup. Record your observations in the table.

Eyeballs in a Jar

Investigating the Movement of Solids and Liquids

What can you observe about the substances and marbles in three jars?

Mad Scientist Steve loves to play with eyeballs and brains. Steve observes the jars on the shelf. He wants to compare different jars so he will soon be able to have more than one eyeball and maybe a new brain! He also wants to know how things move, as he loves to watch things that are ooey and gooey.

Materials:
 * 3 jars with lids labeled A, B, C each containing a marble.

Steps:
Step One: Observe the **liquid** in jar A. Move the jar around in your hand. Record your observations in the table below.
 Keep in mind: what happens to the liquid in the jar? How fast does it move? Does the liquid make a sound when you gently shake the jar? If it does, describe the sound.
Step Two: Observe the **marble** in jar A. Record your observations in the table below.
 Keep in mind: what happens to the marble when you move the jar? How fast does the marble move in the liquid?

Elephants Toothpaste!

Investigating the Effects of a Chemical Reaction on Matter

First Observations	State of Matter	Prediction Before an adult pours in the yeast and water	Observations after all is mixed	State of Substance

Take a closer Look!

Nonfiction with Questions & Readers

How Can You Observe and Measure Properties of Matter?

Matter can be observed and measured by its properties. **Properties** are something about an object that you can observe with your **senses**.

There are many properties that you can observe. Some of the properties that you can observe are **texture** (how something feels), whether an object sinks or floats, the color, and the shape.

Measuring properties includes size or length, the weight, **volume** (how much space matter takes up), and **temperature** (how hot or cold something is). These properties need some tool in which to measure.

Questions:

1. What does the word volume mean? _____
2. What text evidence supports the idea that the properties of matter can be observed and measured? _____
3. Why did the author most likely write "How Can Matter?" _____



How Does Matter Change?

Some solids can change when they are mixed with water or other liquids. Sometimes when we mix solids with liquids, they become a solution. Sometimes the temperature helps a solid mix with a liquid to become a **solution**.

Some solids do not **dissolve** in liquid. Sand, a solid with very small particles, does not dissolve in water. Sand and water do not become a solution. Two parts remain separate even in the same container.

Solid matter can also change shape. All matter does not change in the same way. Some matter can be bent, folded, cut, chipped, broken, or torn. You can fold paper to write a note. You can also break candy to share a piece with your sibling or friend.

Questions:

1. How do you change the state of solids? (Be sure to support your answer with evidence from the text.) _____
2. Why would someone want to change the state of matter? _____

Particles of Matter

In Architecture

By Trina DeBoree

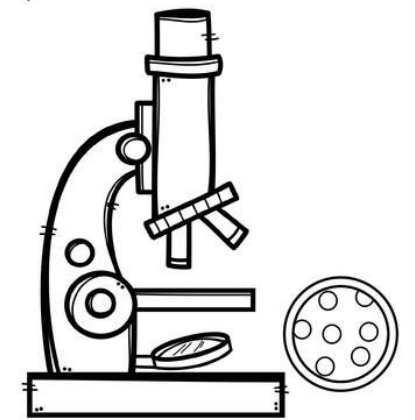
Illustrations by Creative Clips and Chirp Graphics

Trina DeBoree
Teaching and Learning



Particles of Matter

Tiny **particles** make up all matter. We can't see small particles with our eyes. We call small particles atoms. Scientists can use a **microscope** to view small particles or atoms.



Page 1

Informational text standards covered

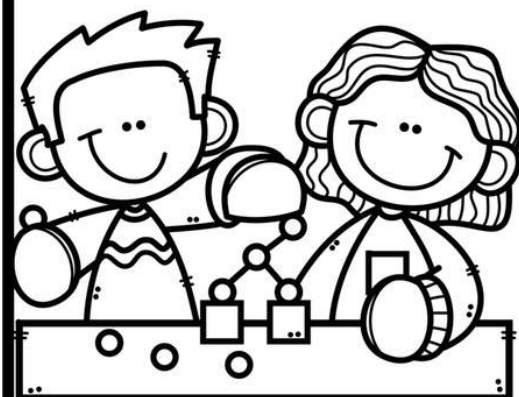
Integrate STEM into your reading block

Architectural Engineers

Architectural engineers make sure structures are strong and safe. They understand the challenges that can occur in the building. They know how to use the materials to build a structure that is **durable** and can hold up to intense weather.



structures do you see? How did all the pieces go together? How might you build it if you were the architect?



Page 7

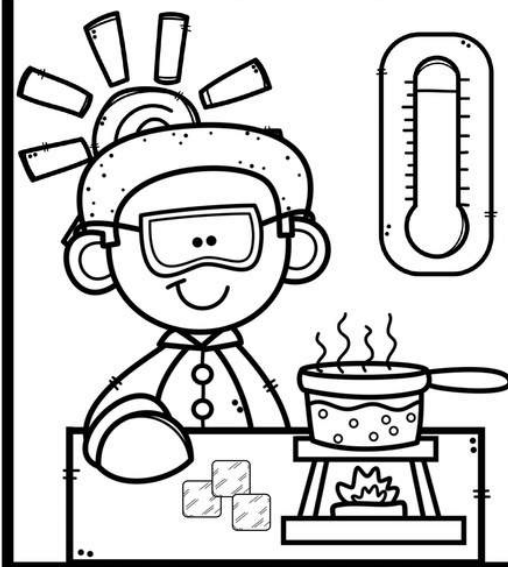
The States of Matter?

Physical Changes in Matter

By Trina DeBoree

Illustrations by Creative Clips

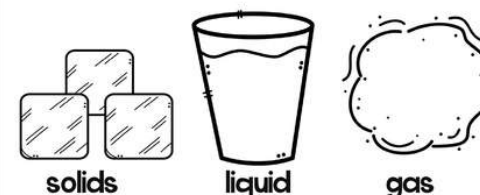
Trina DeBoree
Teaching and Learning



Change?

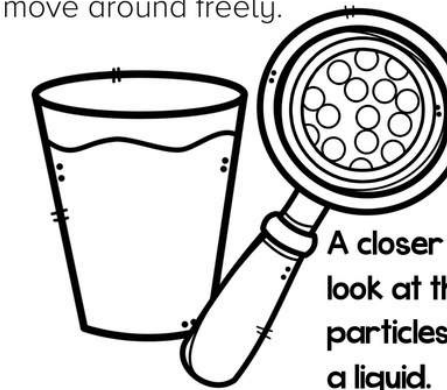
What do steam, water, and ice have in common? They are all water! How can that be possible? Well, water and other types of matter are able to change states. They can become solids, liquids, or gases.

Matter can come in different forms. Solids, liquids, and gases are forms of matter.



Page 1

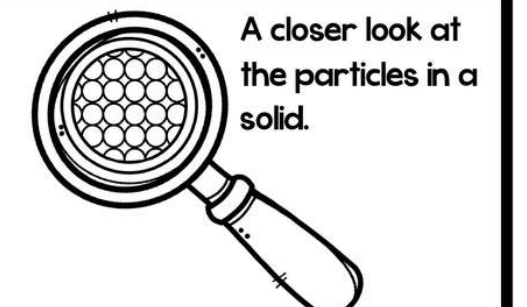
move around freely.



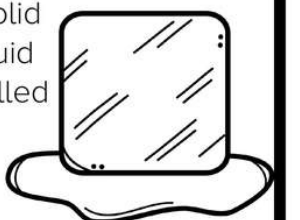
The particles in the ice are closely-packed, so they can't move around very much.



Page 4



You can **reverse** freezing water or ice by turning up the heat. The particles start moving around more, and the solid ice turns into liquid water. This is called **melting**.



Boiling

What happens when you turn the heat up even more on a liquid?

Page 5

Close-Up Look at Nonfiction

Informational

Nonfiction Reading Standards

Questions

Student Thinking Required

How Can You Observe and Measure Properties of Matter?

Everything can be observed and measured by its properties. **Properties** are something about an object that you can observe with your **senses**.

There are many properties that you can observe. Some of the properties you can observe are **texture** (how something feels), whether an object floats, the color, and the shape.

Measuring properties includes size or length, the weight, **volume** (how much space matter takes up), and **temperature** (how hot or cold something is). These properties need some tool in which to measure.

Questions:

1. What does the word volume mean? _____

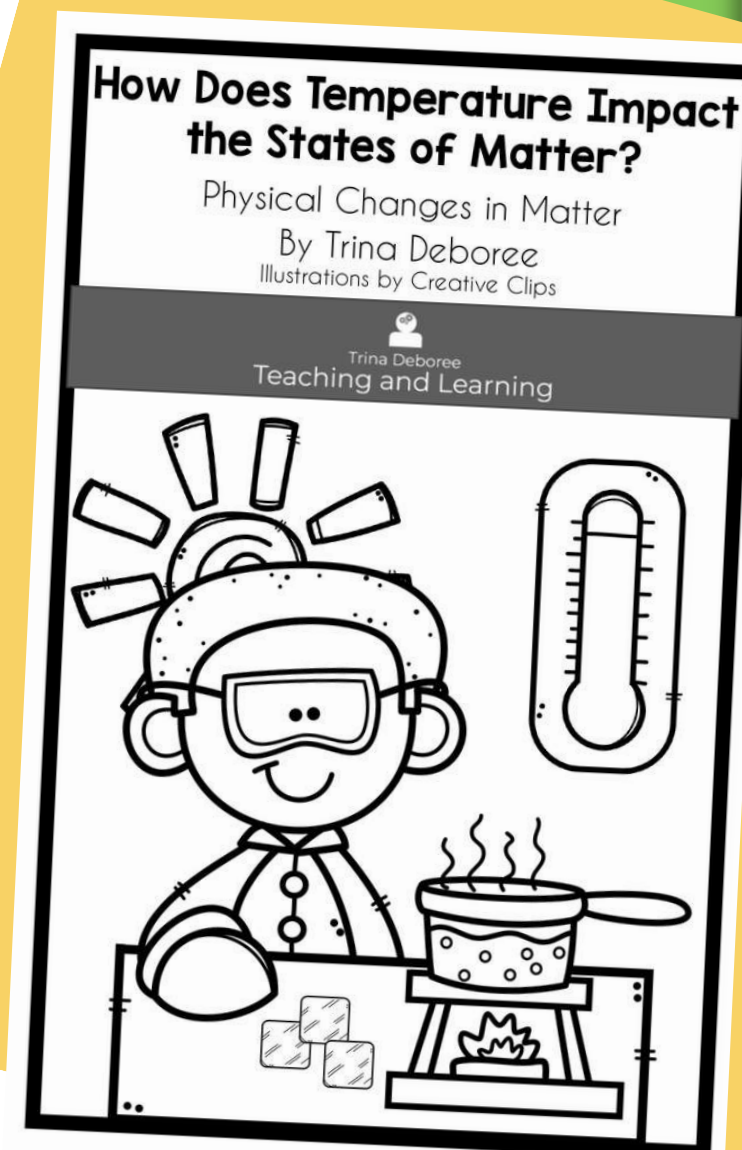
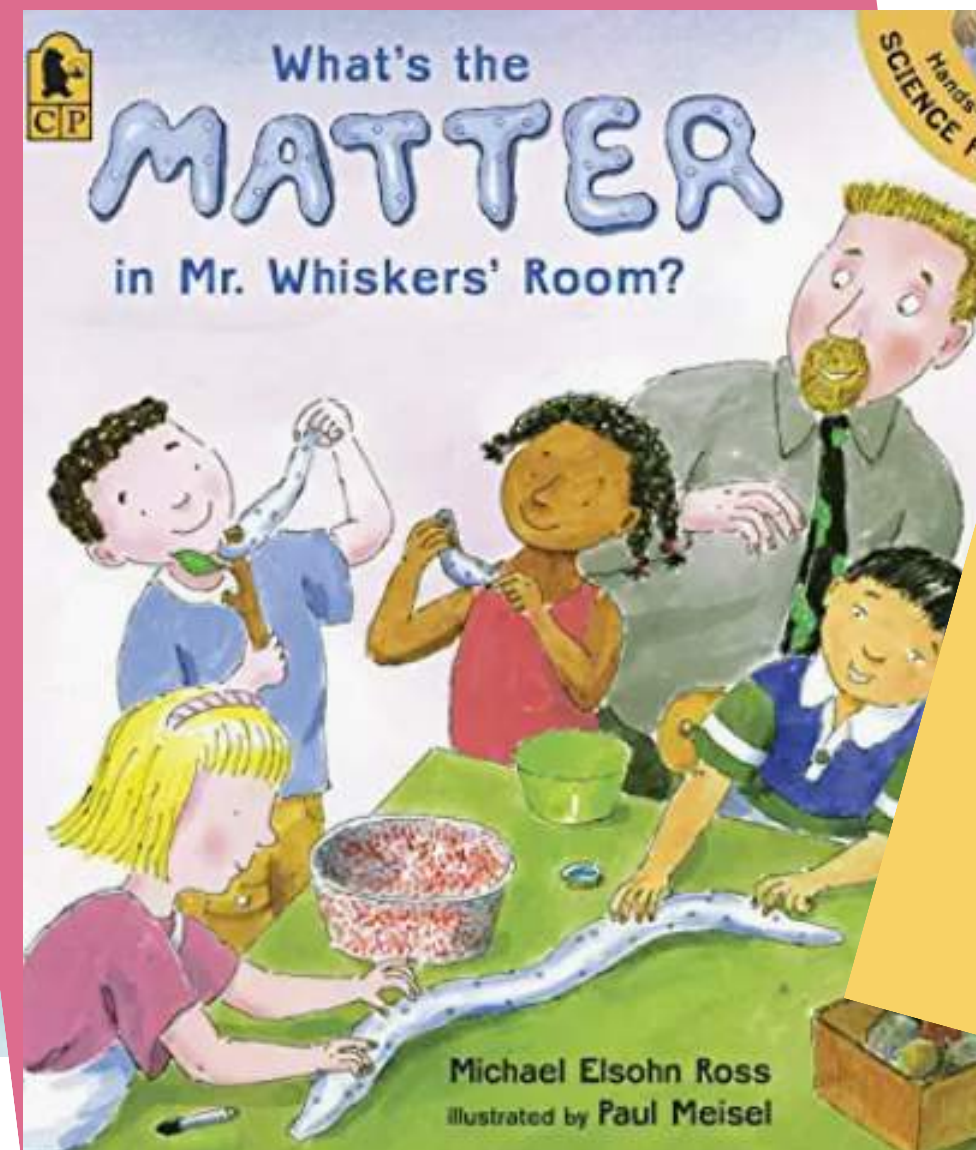
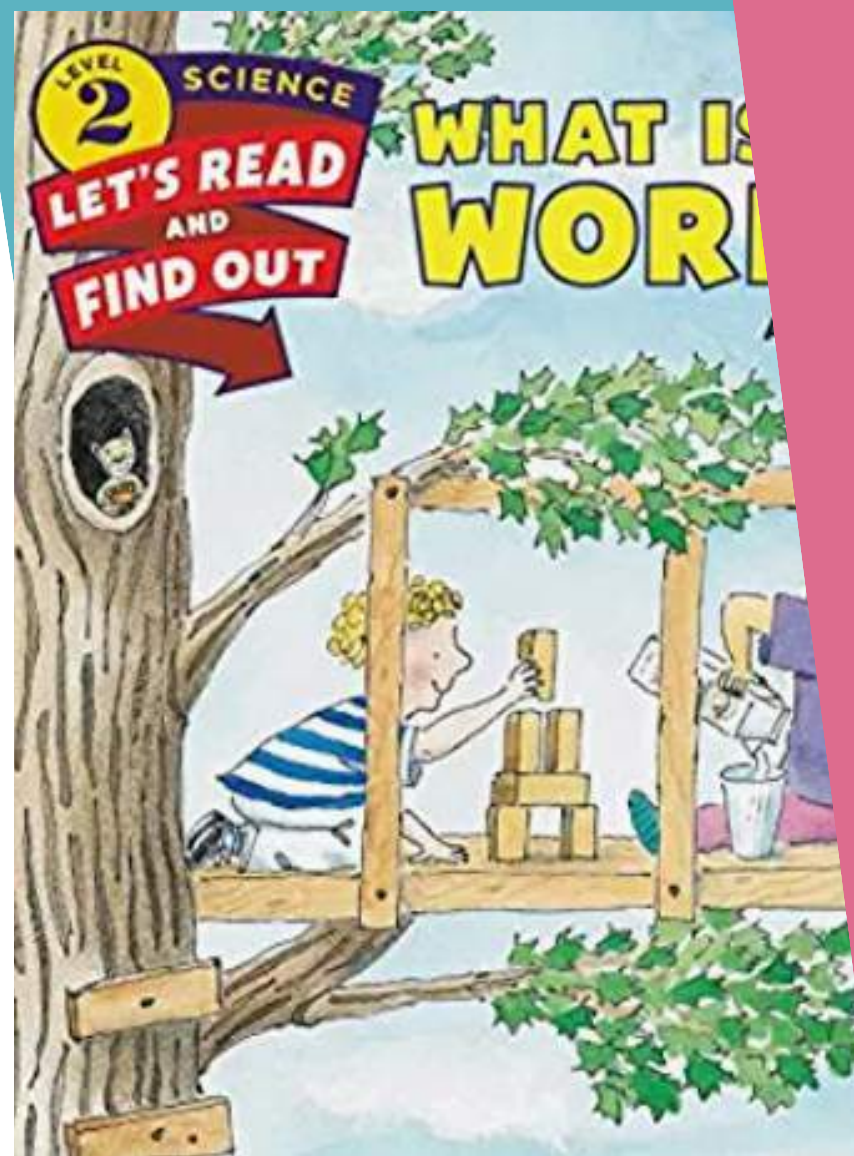
2. What text evidence supports the idea that the properties of matter can be observed and measured? _____

3. Why did the author most likely write "How Can You Observe and Measure Properties of Matter?" _____



↓ More

Literature Integration



↓ More

Assessments

Matter Vocabulary

Word	Meaning	Examples from the text	Examples From the Activity
	the feel or look of a surface (how something feels)		
	how hot or cold something is		
	something about an object that you can observe with your senses		
	any of the 5 ways you experience your environment (touch, smell, taste, hear, see)		
	how much space matter takes up		

Structure and Properties of Matter Assessment

Name: _____

1. Which state change can be observed when a pot of water is boiling on the stove?

2.PSI.1-3

- a. Solid to a liquid
- b. Liquid to a gas
- c. Gas to a solid



2. Which one of the following is true of building a house.

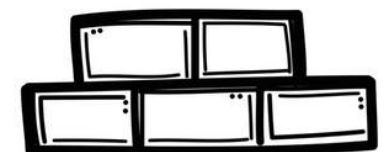
2.PSI.1-3

a. If you use bricks, the house cannot be destroyed.
 b. The more materials you add, the larger the house becomes.

c. If you use wood to build a house, it will fall over.

d. The more materials you use, a house can only be a cube.

e. The properties describes both wood and metal. Choose

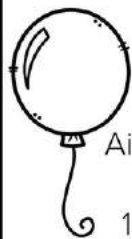


Page 1

Name: _____

Matter Quiz

Write solid, liquid, or gas on the lines below.



Air in balloon

1. _____



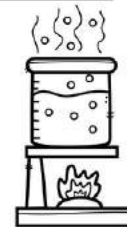
Raindrop

2. _____



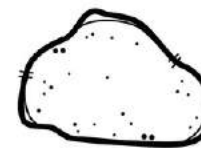
Lemonade

3. _____



Bubbles/Steam

4. _____



Rock

5. _____

Definition next to each word.

- A. To mix a substance into a liquid until you can no longer see it.
- B. Matter that has no shape and spreads out to fill a space.
- C. Anything that has weight and takes up space.
- D. Matter that is wet and takes the shape of the container.
- E. Matter that holds its shape.

Formative and Summative



More

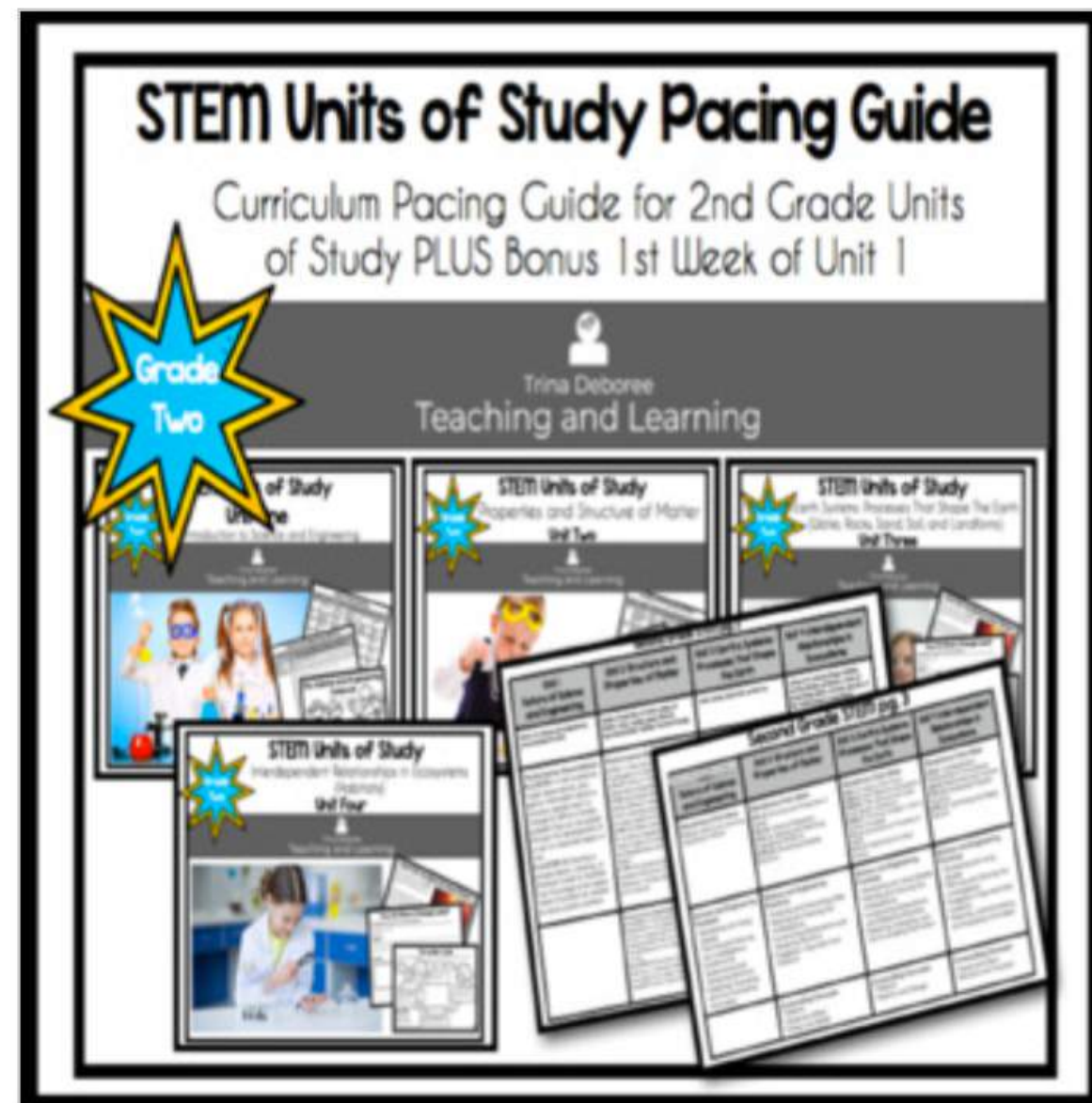
Integrate STEM AND Take Back Your Planning Time Today!

The collage features several educational resources:

- Properties and Structure of Matter**: A table with columns for LP Element and Week Five: Observable Properties. It includes sections for Performance Expectations, Core Ideas, Science and Engineering Practices, Cross Cutting Concepts, Essential Questions, and Vocabulary.
- Structure and Properties of Matter Week Five: Day One- Matter Changing States Engage/Explore**: A table with columns for LP Element and Day One- Matter Changing States Engage/Explore. It includes sections for Materials, Assessment, and Lesson.
- My Science and Engineering Matter Notebook**: A notebook cover with a name line and an illustration of four scientists in a lab.
- Particles of Matter In Architecture**: A worksheet by Trina Deborze, featuring an illustration of a building.
- Help Your Teacher! AGAIN!**: A worksheet with a cartoon scientist character and instructions for a lab activity involving unknown mixtures.
- Building a Structure Challenge**: A worksheet with a cartoon scientist character and instructions for a challenge involving building a structure to survive flooding.

Download Free STEM Pacing Guide for Second Grade

Click the Image Below to Download.



TRINA DEBOREE

Let me know if you have any questions.