

UNIT OVERVIEW

Designed to excite curiosity and connect prior knowledge, students are engaged in 8 high interest lessons that include a teaching PowerPoint with vivid, real world photographs.

Students identify and explore three states of matter: solid, liquid, and gas. They learn that an object's properties determine the job it can do and discover that some objects and their specific properties can serve a purpose better than others.

As students learn about matter and its properties, they explore ways that matter can change. They explain whether a change caused by heating or cooling is reversible or irreversible.

Students are introduced to science practices, such as making observations, constructing explanations, using evidence to support a claim, and designing solutions to problems.

During each lesson students are presented with engineering connections that enable them to understand how solids, liquids, and gases are used for building and designing solutions to problems. Students learn and explore through investigations that man-made objects are often inspired by patterns found in nature.

As the unit progresses students plan and carry out investigations, respond in science journals, and view videos on the topics of each lesson. Students engage in **Talk About It** partner discussions after each lesson and complete **Write About It** activities in their science journals.

Key science vocabulary is introduced in each lesson and defined in context. Students also use the science content to practice literacy skills. Students work with cause & effect, comparing/contrasting, classifying, and sequencing during science center extension activities.

Students are assessed after each lesson with Quick Check exit tickets in a choice of 2 formats. A final assessment is given upon completion of the unit.

Display resources including posters, learning target cards, and picture cards, offer lesson support and visual references for students throughout the unit.

TEACHING POWERPOINT

8 ENGAGING, CONTENT-RICH LESSONS:

Describing Matter
Properties of Matter
Understanding Solids
Understanding Liquids
Understanding Gases
Changing Matter
Temperature & Matter
Matter Within Objects





Aligned to
**Next Generation
Science
Standards, TEKS,**
and
**Common Core
State Standards**
for 2nd Grade

STANDARDS BASED

TEACHER GUIDE

Scripted lesson plans
Lesson objectives
Performance tasks
Teacher's notes
Management tips
Lab procedures
Extension activities
Assessments

15 Day Pacing Guide

The collage features numerous lesson plan pages, each with a 'TEACHER GUIDE' header. Visible titles include: 'Changing Matter' (Lesson 6), 'Temperature and Matter' (Lesson 7), 'Carbonation Exploration' (Lesson 5), 'Design & Build A Dam' (Lesson 4), 'What Shapes Are Best for Building?' (Lesson 8), 'Ice Cream in a Bag' (Lesson 7), 'Understanding & Using Liquids' (Lesson 4), 'Ice Cream in a Bag' (Lesson 7), 'Understanding & Using Solids' (Lesson 3), 'Testing Flexibility' (Lesson 2), 'Describing Matter' (Lesson 1), 'Properties of Matter' (Lesson 2), 'Design a Toy Using a Solid, Liquid & Gas' (Lesson 3), and 'Describing Matter Cracker Lab' (Lesson 1). Each page contains learning targets, materials lists, and detailed activity instructions.

This section shows pages for 'UNIT OVERVIEW' and 'STANDARDS ALIGNMENT'. The 'UNIT OVERVIEW' page includes a table for 'Unit Pacing' and a 'Cracker Lab' activity. The 'STANDARDS ALIGNMENT' page lists 'Next Generation Science Standards' and 'Common Core State Standards'.

Day	Lesson
1	Lesson 1: Describing Matter
2	Investigation 1
3	Lesson 2: Properties of Matter
4	Investigation 2
5	Lesson 3: Understanding & Using Solids
6	Investigation 3

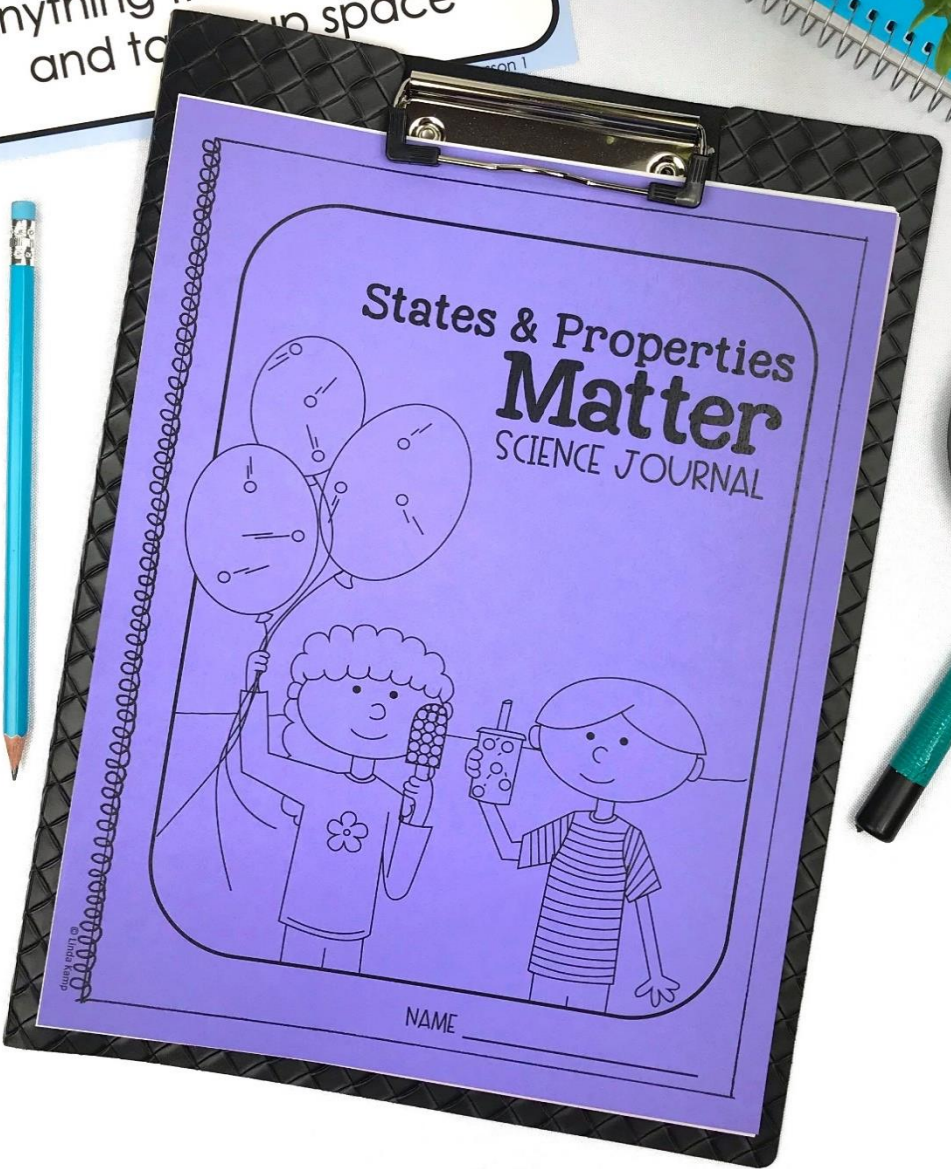
Cracker Lab
Students describe matter by their features or properties. Look closely at different types of crackers to remember that features can be size, shape, color and they have similar features, some may be different.
Draw each of your crackers in the chart. Think about...

Next Generation Science Standards
PS.1.A Structure and Properties of Matter: Understand that different types of matter exist and can be described based on observable properties.
2.PS.1.1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

Common Core State Standards
RI.2.9 Describe how reasons support specific points the author makes in a text.
W.2.7 Participate in shared research and writing projects (report...

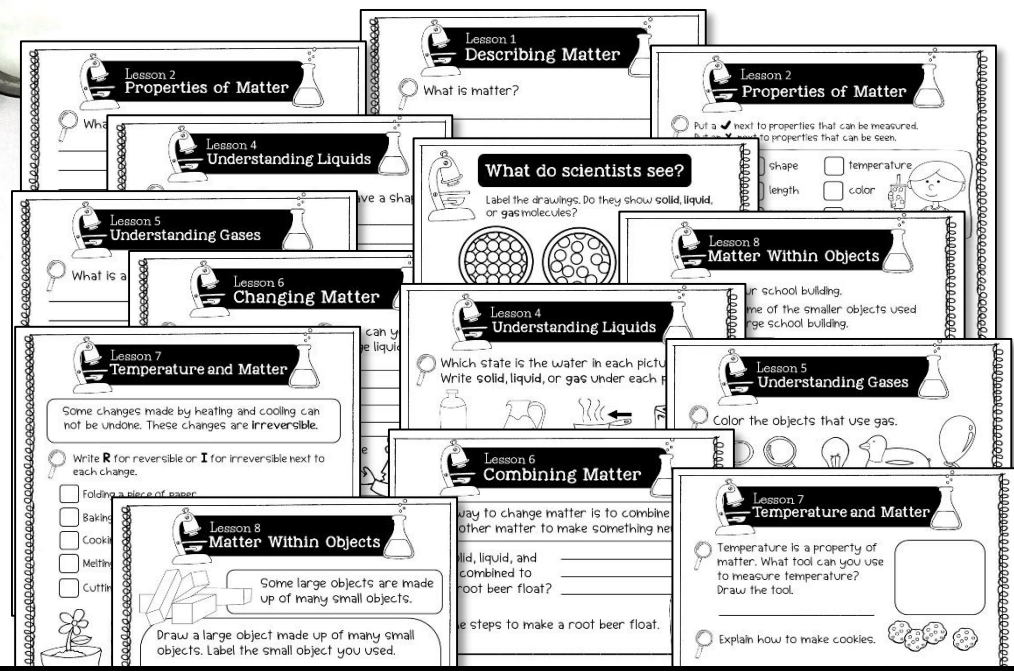
DETAILED LESSON PLANS

properties of an
matter
anything that has weight
and takes up space



RESPONSE JOURNAL ACTIVITIES INCLUDE:

- Short written response
- Writing to explain
- Sequencing
- Categorizing
- Applying vocabulary



LESSON RESPONSE JOURNAL

8 HIGH-ENGAGEMENT LESSONS

During each lesson students discuss, write, and question.

LESSON 1 INVESTIGATE Describing Matter

QUESTION: How can you describe matter?



LESSON 1 JOURNAL Write About It

What do scientists use?

LESSON 1 TALK ABOUT IT Describing matter

Look at objects all around



LESSON 6 INVESTIGATE Changing Matter

Think about the properties of clay. Investigate



LESSON 6 TALK ABOUT IT Changing matter

Talk with your partner about some ways matter can change



LESSON 5 JOURNAL Write About It

What is a substance?

LESSON 6 JOURNAL Write About It

Complete Lesson 6



LESSON 5 TALK ABOUT IT Understanding gases

Talk with your partner about ways you and your family use aas.



LESSON 7 TALK ABOUT IT Irreversible changes

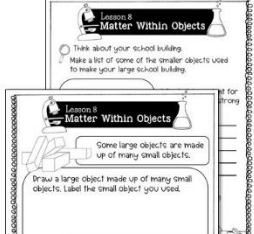
Talk with your partner about



LESSON 2 JOURNAL Write About It

LESSON 8 JOURNAL Write About It

Complete Lesson 8 in your science journal about large objects made from smaller objects.



LESSON 5 INVESTIGATE CANDY & COKE Carbonation Exploration

QUESTION: How can carbonation



LESSON 7 INVESTIGATE Ice Cream IN A BAG


Think about the



LESSON 2 TALK ABOUT IT Properties of matter

LESSON 7 JOURNAL Write About It


Complete Lesson 7



LESSON 2 INVESTIGATE Testing Flexibility

Engineers test their materials to see if they have the properties needed for a specific job.

QUESTION: How can you test if an object is flexible?



LESSON 8 INVESTIGATE What shapes are best for building?


QUESTION: How can an object made of small pieces be taken apart and made into something new?



LESSON 8 TALK ABOUT IT Matter within objects

Talk with your partner about what the roller coaster is made of.

What properties make the materials good for building a roller coaster?



8 HANDS-ON, HIGH INTEREST LABS



After each lesson students explore:

- Uses for solids, liquids & gases
- Comparing properties
- Testing materials
- Reversible/irreversible changes
- Cause and effect
- Designing solutions
- Building models
- Planning investigations

STEP-BY-STEP GUIDES

With teacher tips, procedures, & pictures



Investigation 8 **TEACHER GUIDE**
Lesson 8 **What Shapes Are Best for Building?**

QUESTIONS: How do you use shapes when building? How can an object be made into something new?

OBJECTIVE: Students will show how an object made of smaller pieces can be disassembled and made into a new object. Students will collect data about different blocks and identify those that are useful.

MATERIALS:

Investigation 2 **TEACHER GUIDE**
Lesson 2 **Testing Flexibility**

QUESTION: How can we test objects for flexibility?

OBJECTIVE: Students will plan and carry out an investigation to test objects for flexibility. Students will record science observations to classify materials by observable properties.

MATERIALS:
 Prep per small group a variety of flexible and non flexible objects.
 Examples:
 -1 piece of pool noodle
 -rubber band
 -plastic spoon
 -metal spoon
 -spaghetti noodle
 -drinking straw
 -student lab sheet

SEARCH CHECKS ARE FLEXIBLE?

OBJECT	BEND?	FLEXIBLE?
pool noodle	yes	yes
rubber band	yes	yes
plastic spoon	no	no
metal spoon	no	no
spaghetti noodle	yes	yes
drinking straw	yes	yes

Investigation 4 **TEACHER GUIDE**
Lesson 4 **Design & Build A Dam**

QUESTION: How can I build a structure to change the flow of water?

OBJECTIVE: Students will plan, design and build a dam for the purpose of changing the flow of water.

MATERIALS:
 -student lab sheet

Investigation 1 **TEACHER GUIDE**
Lesson 1 **Describing Matter Cracker Lab**

QUESTION: What properties can you observe that describe the crackers?

OBJECTIVE: Students will compare properties of objects.

MATERIALS:
 Prep per student:
 -5 types of crackers in different shapes and sizes
 -paper towel, napkin, or paper plate
 -student lab sheet

INVESTIGATION:
 Explain to students: "Scientists describe matter by their features or properties. In this investigation you will look closely at different types of crackers to observe their features. Remember that features can be size, shape, color and texture. Some crackers may have similar features, some may be different."
 Give the following directions. Draw each of your crackers in the chart. Think about adjectives you can write to describe the features of your crackers and write them in the space provided.

Cracker Lab

Cracker	Texture	Color	Size	Shape
round	crunchy	tan	large	round
square	crunchy	orange	medium	square
triangular	crunchy	orange	small	triangular
rectangular	crunchy	orange	medium	rectangular
oval	crunchy	orange	small	oval
heart shaped	crunchy	orange	small	heart shaped
star shaped	crunchy	orange	small	star shaped
circle	crunchy	orange	small	circle
square	crunchy	orange	small	square
circle	crunchy	orange	small	circle
circle	crunchy	orange	small	circle

Investigation 3 **TEACHER GUIDE**
Lesson 3 **Design a Toy Using a Solid, Liquid & Gas**

QUESTION: How can you use a solid, liquid and a gas to make a toy?

OBJECTIVE: Students will design a solution to a problem. Students will design a toy using specific materials.

MATERIALS:
 Provide a variety of materials for building:
 masking tape
 craft sticks
 straws
 pipe cleaners
 cardboard
 building blocks
 clay
 bubble wrap
 small balloons
 liquid glue
 scissors

TEACHER NOTE: If time allows, have students build their designs with the above materials. Otherwise have students draw & design a toy using materials pictured in the Power Point slide.

Investigation 5 **TEACHER GUIDE**
Lesson 5 **Carbonation Exploration**

QUESTION: How can carbonation blow up a balloon?

OBJECTIVE: Students will form a gas by combining a solid and liquid to inflate a balloon.

MATERIALS:
 -student lab sheet
 -20 oz. bottle of soda
 -1 pkg. Pop Rocks candy
 -small kitchen funnel
 -8" balloon
 -student lab sheet

PROCEDURE:
 Explain to students: "Today we are going to investigate how gas forms when we combine..."

Investigation 6 **TEACHER GUIDE**
Lesson 6 **Changing Matter Play Doh Lab**

QUESTION: How can you change matter?

OBJECTIVE: I can explore ways matter can be changed. I can make a plan and carry out an investigation.

MATERIALS:
 -2 balls of Play Doh
 -plastic paper
 -student lab sheet

PROCEDURE:
 Tell students they can be observed. Give each student a paper clip. Give the following directions:
 1. Make a ball of play dough.
 2. Follow the directions.
 3. Answer the questions.

TEACHER NOTE: Explain to students: "Today we are going to investigate how matter changes when it is cooled and heated."

Investigation 7 **TEACHER GUIDE**
Lesson 7 **Ice Cream in a Bag**

QUESTION: How is matter changed by heating and cooling?

OBJECTIVE: Students will investigate how a liquid mixture changes when it is cooled and heated.

MATERIALS PER STUDENT:
 1 c. half-and-half
 2 Tbs. sugar
 1/2 tsp. vanilla extract
 3 c. ice
 1/3 c. rock salt or kosher salt
 sandwich size Ziplock bag
 student lab sheet
 1 Gallon size Ziplock bag per 2 students
 plastic spoons

PROCEDURE:
 NOTE: I recommend making a large batch of this recipe in a pitcher ahead of time. Multiply the recipe by the number of students in your class.
 1. Pour 1 cup of the mixture into each student's bag. Push out the excess air and seal.

5 SCIENCE CENTERS



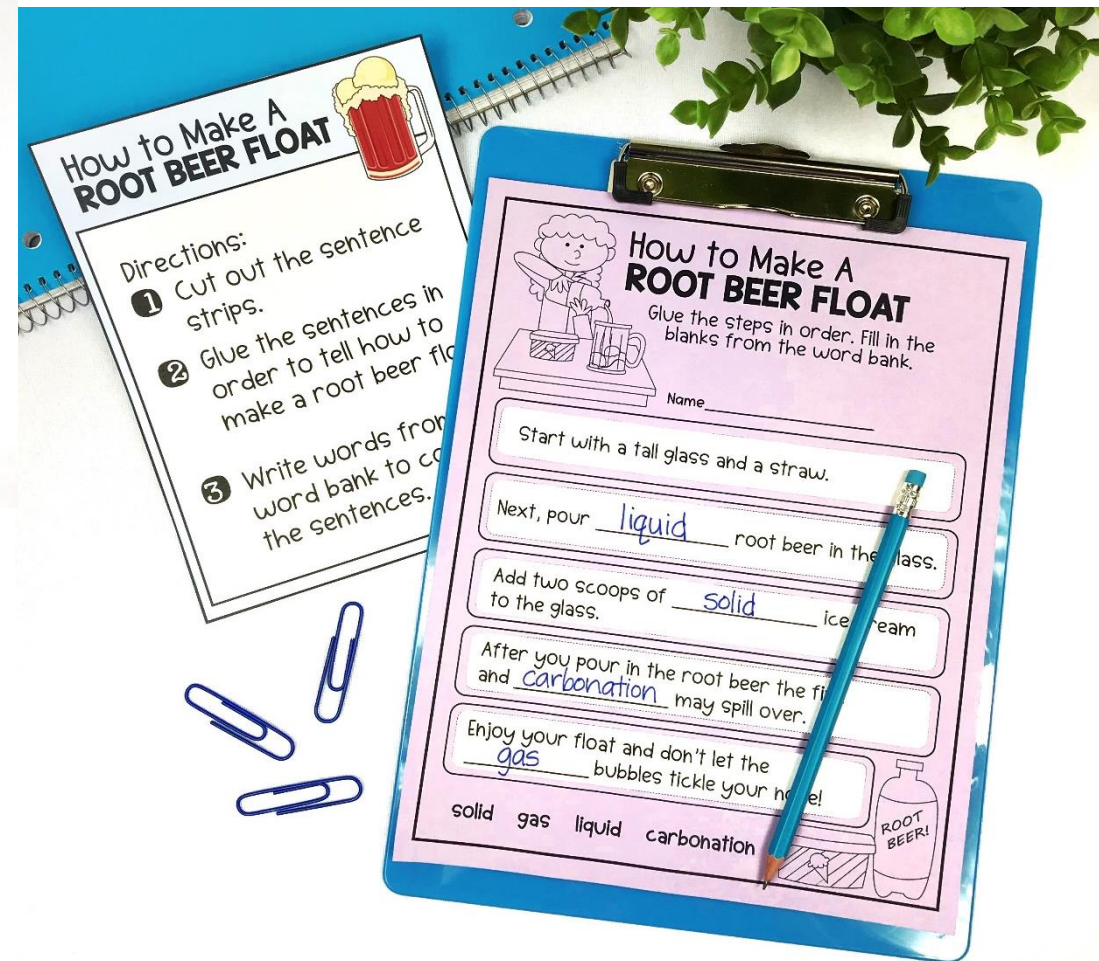
Literacy based EXTENSION ACTIVITIES



Integrate science in your reading centers



Reinforce **SCIENCE CONTENT**



Practice **LITERACY SKILLS**

Centers included in color and black & white

LESSON SUPPORT

Full page Vocabulary posters



solid

Matter that has its own shape and size. Ice is the solid form of water.



liquid

Matter that does not have its own shape. Liquids take the shape of their container.



gas

Matter that does not have its own shape or size. Gas filled the bicycle tire.



purpose

The use of an object. The purpose of a pencil is to write.



combine

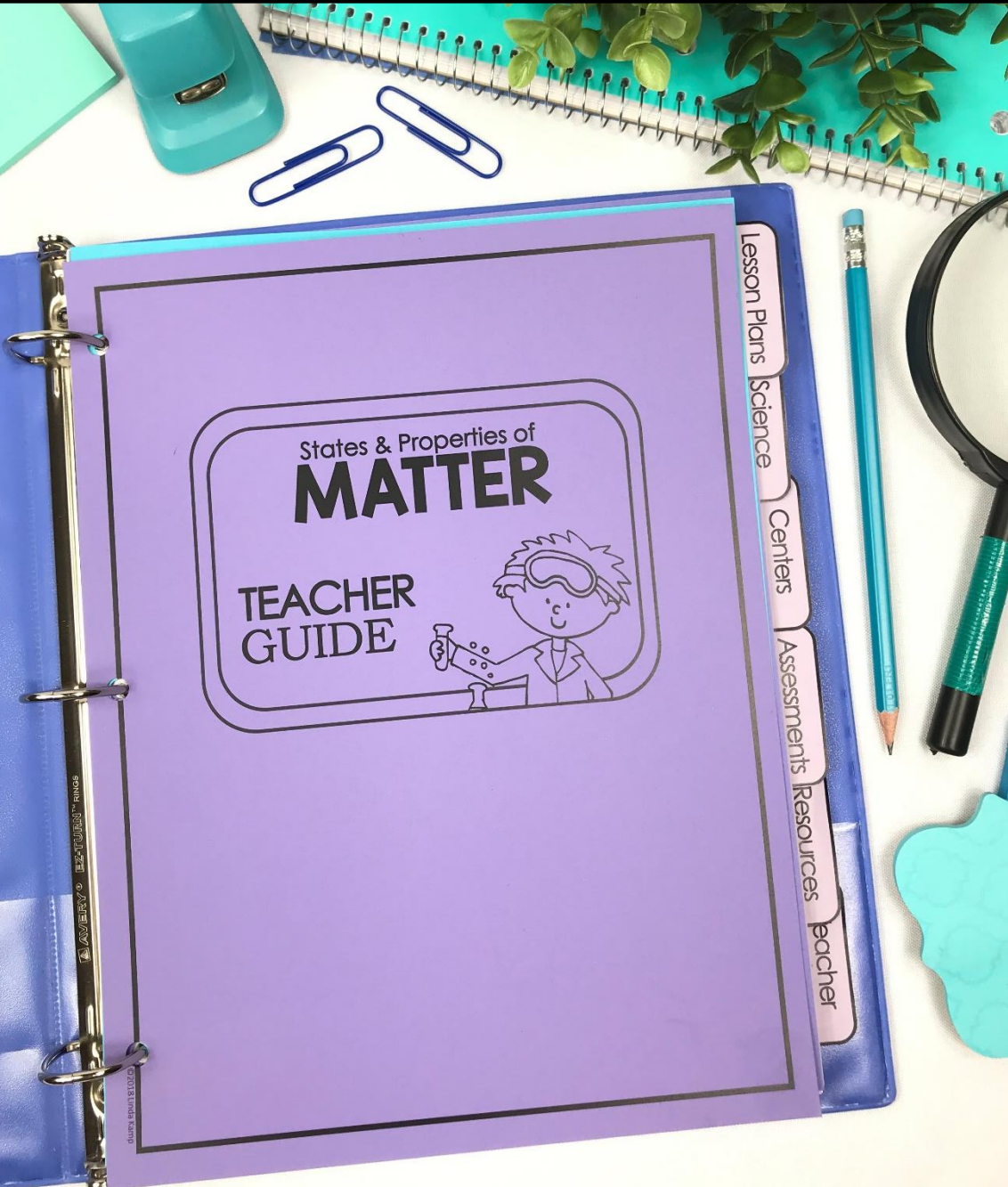
Put two or more things together to make something new.



property

A trait or feature of an object you can observe. Color, shape and size are some properties.

UNIT PLANNING BINDER

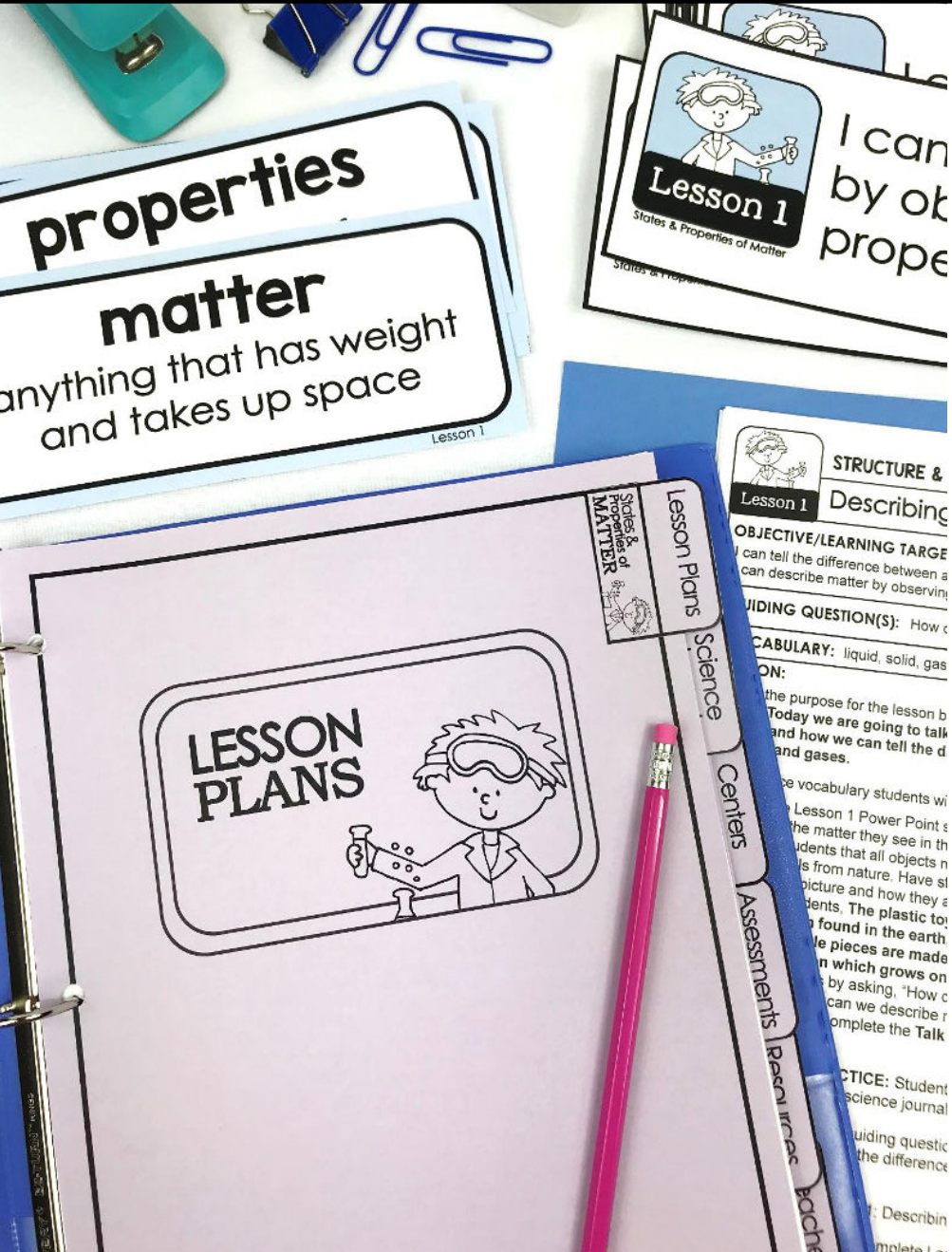


Organize your unit
in a handy
planning binder

Binder includes:

- binder cover
- binder spines
- section dividers
- divider tabs

UNIT PLANNING BINDER



PLAN - TEACH - ASSESS
an engaging, organized
and effective unit



Store posters and centers in page protectors

Science for Second Grade

Lesson 5: Understanding Gases

Lesson 1
States & Properties of Matter

matter
anything that has weight and takes up space

Lesson 2: Properties of Matter

Lesson 1
States & Properties of Matter

GUIDING QUESTION
How can properties of matter be used to describe an object?

I can describe matter by observing its properties.

gas
Matter that does not have its own shape or size. Gas filled the bicycle tire.

States & Properties of Matter
Matter
SCIENCE JOURNAL

Mom put helium gas in balloons for my party.

Anything that has weight and takes up space is _____.

A. a property
B. a solid
C. a gas
D. matter

NAME _____

Properties of Matter Cracker Lab

Name _____

Draw your Cracker	Describe the Texture	Describe the Color	Describe the Size	Describe the Shape
	raised	tan	medium size 1/2 inches	triangle shaped
	wavy	orange	small 1 inch	fish shaped
	smooth greasy	golden brown	small	elephant shaped
	smooth dry	light yellow	large 2 1/2 inches	rectangle shaped
	uneven lumpy			round

States & Properties of

MATTER

GRADE
2



Students gain an understanding of:

- States of matter & its properties
- Reversible & irreversible changes
- Building models
- Testing materials
- Planning & conducting investigations
- Analyzing data
- Science & engineering practices
- Constructing explanations
- Using evidence to support claims
- Designing solutions to problems