

Expert Pack: What are the Properties of Matter?

Submitted by: Milwaukee Public Schools

Grade: 2-3

Date: March 2016

Topic/Subject

What are the properties of matter?

Texts/Resources

Book(s)

1. *A Matter of Survival*
2. *Beans to Chocolate*
3. *Solids, Liquids, and Gases*

Article(s)

4. "Comparing Solids"
5. "Solids and Liquids"

Video(s)

6. "A First Look: Solids, Liquids, and Gases"
7. "Changing States of Matter"

Other Media

8. "Matter Matters Poetry" (Website)
9. "Solids, Liquids, Gases" (Website)
10. "States of Matter" (Interactive website)

Each expert pack contains a variety of selections grouped to create as coherent and gradual a learning process for students as possible, generally beginning with lower levels as measured by quantitative and qualitative measures, and moving to more complex levels in the latter selections. This graded approach helps support students' ability to read the next selection and to become 'experts' on the topic they are reading about.

Refer to annotated bibliography on the following pages for the suggested sequence of readings.

Rationale and suggested sequence for reading:

The read aloud narrative *Beans to Chocolate* introduces students to two states of matter, solids and liquids, using a subject that children are familiar with. The second resource, "Solids and Liquids" offer students an overview of solids and liquids with a text that can be read independently. To continue building vocabulary and knowledge students will watch "A First Look: Solids, Liquids, and Gases." This resource provides many more examples of the three states of matter and has the ability to reach the visual learners as well as the audio learners. To give students another opportunity to build their foundation on matter students will have the opportunity to read the article "Comparing Solids" and the book *Solid, Liquids, and Gases*. These independent reads will push their learning a step further by not only reviewing solids, but introduces the idea of describing and comparing items in the same state as well as different types of matter around their environment. At this point students have a strong foundation of solids, liquids and gases and are ready to assess their level of expertise by visiting the interactive website ABCya.com. Moving beyond the states of matter, students broaden their understanding of the states of matter by viewing "Changing States of Matter." The Scholastic website "Solids, Liquids, and Gases" reviews all the information in the expert pack and also provides an opportunity to check for understanding with an interactive quiz. The study concludes with the read aloud *A Matter of Survival*. The challenge is to take the knowledge learned and apply it to surviving on an island. Poems are provided for continued exploration with the concepts of matter and key vocabulary in a unique format.

The Common Core Shifts for ELA/Literacy:

1. Regular practice with complex text and its academic language
2. Reading, writing and speaking grounded in evidence from text, both literary and informational
3. *Building knowledge through content-rich nonfiction*

Though use of these expert packs will enhance student proficiency with most or all of the Common Core Standards, they focus primarily on Shift 3, and the highlighted portions of the standards below.

College and Career Readiness Anchor Standards for Reading Literary and/or Informational Texts (*the darkened sections of the standards are the focus of the Expert Pack learning for students*):

1. **Read closely to determine what the text says explicitly and to make logical inferences from it;** cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2. **Determine central ideas or themes of a text and analyze their development;** summarize the key supporting details and ideas.
10. **Read and comprehend complex literary and informational texts independently and proficiently**

Annotated Bibliography and suggested sequence for reading

550L *Beans to Chocolate*

Author: Lisa M. Herrington

Genre: Non-fiction, Informational Text

Length: 32 pages

Synopsis: This informational text explains how chocolate is made emphasizing the physical changes that occur. From the tropical cacao plant to the factory, readers are able to see the process of making chocolate from start to finish.

Citation: Herrington, L. (2013). *Beans to Chocolate*. Scholastic Inc.

Cost/Access: \$4.16

Recommended Student Activities: Teacher read aloud and Wonderings

480L “Solids and Liquids”

Author: Rachelle Kreisman

Genre: Informational text

Length: 111 words

Synopsis: This short article describes the differences between solids and liquids. Examples of solids and liquids are provided, as well as a basic definition of matter.

Citation: Solids and Liquids. (n.d.). Retrieved April 28, 2015, from <http://www.readworks.org/passages/solids-and-liquids>

Cost/Access: \$0.00 Read Works <http://www.readworks.org/passages/solids-and-liquids>
On the Read Works home page, log in with existing account information or register for a free account.

Recommended Student Activities: Questions included with text to check for understanding; Quiz Maker

N/A “A First Look: Solids, Liquids, and Gases”

Author: Cochran

Genre: Informational video; live action, narrative setting with science experiments

Length: 17 minutes

Synopsis: Define matter, describes states of matter and explains how matter can change from one state to another.

Citation: Cochran, (2001). A First Look: Solids, Liquids, and Gases. [Full Video]. Retrieved April 10, 2105, from <http://app.discoveryeducation.com/player/view/assetGuid/BBCF5588-93C8-4914-8442-01D1C296ACB7>

Cost/Access: \$0.00 Discovery Education <http://www.discoveryeducation.com/>
On the home page, log in with existing account information or register for a free limited access account.

Recommended Student Activities: A Picture of Knowledge

510L “Comparing Solids”

Author: Rachelle Kreisman

Genre: Informational text

Length: 201 words

Synopsis: This text describes the different properties of solids – like color, shape, size, and texture. It compares the similarities and differences of a bowling ball and a tennis ball.

Citation: Comparing Solids. (n.d.). Retrieved April 28, 2015, from <http://www.readworks.org/passages/comparing-solids>

Cost/Access: \$0.00 Read Works <http://www.readworks.org/passages/comparing-solids>
On the Read Works home page, log in with existing account information or register for a free account.

Recommended Student Activities: Questions included with text to check for understanding; Quiz Maker

150L *Solids, Liquids, and Gases*

Author: Ginger Garrett

Genre: Non-fiction, Informational Text

Length: 32 pages

Synopsis: This informational text explains the different forms of matter through real photos and clear explanations. Different examples of matter, like bones and blood in the human body, are used to show the states of solid, liquid, and gas.

Citation: Garrett, G. (2004). *Solids, Liquids, and Gases*. Scholastic Inc.

Cost/Access: \$3.71

Recommended Student Activities: Pop Quiz

N/A “States of Matter”

Author: ABCya.com

Genre: Interactive website

Length: TBD by each student

Synopsis: Animated and narrated slide show defines the three states of matter and describes the properties of matter. It includes an online sorting game.

Citation: State of matter. (n.d.). Retrieved April 23, 2015, from http://www.abcya.com/states_of_matter.htm.

Cost/Access: \$0.00 ABCya.com http://www.abcya.com/states_of_matter.htm

Recommended Student Activities: Interactive Website

N/A “Changing States of Matter”

Author: Brain Pop Jr.

Genre: Informational Video

Length: 4:38 minutes

Synopsis: Short animated video defines the states of matter and the different properties, as well as how matter changes states.

Citation: Changing states of matter. (n.d.). Retrieved May 12, 2015,

<https://jr.brainpop.com/science/matter/changingstatesofmatter/>

Cost/Access: \$0.00 Brain Pop Jr. <https://jr.brainpop.com/science/matter/changingstatesofmatter/>
Requires subscription for full access, however log-ins and passwords are available online.

Recommended Student Activities: A Picture of Knowledge

N/A “Solids, Liquids, Gases”

Author: Scholastic

Genre: Informational video that is animated and has an interactive quiz and song

Length: 3:23 minutes

Synopsis: Animated cartoon video introduces solids, liquids, and gases and shows how states of matter can change. Students can take an interactive quiz and listen to the “Solids, Liquids, and Gases” song or sing karaoke.

Citation: Solids, liquids, gases. (n.d.). Retrieved April 28, 2015, from <http://studyjams.scholastic.com/studyjams/jams/science/matter/solids-liquids-gases.htm>

Cost/Access: \$0.00 Scholastic.com
<http://studyjams.scholastic.com/studyjams/jams/science/matter/solids-liquids-gases.htm>

Recommended Student Activities: Interactive Website

580L *A Matter of Survival*

Author: Ann Weil

Genre: Non-fiction, Informational Text

Length: 32 pages

Synopsis: When you are stranded on a deserted island after a plane crash, you need to know how to survive. This book helps students understand the importance of the properties of matter when choosing what materials to use that will help you survive.

Citation: Weil, A. (2005). *A matter of survival*. Raintree Fusion Publishing

Cost/Access: \$7.99

Recommended Student Activities: Teacher read aloud and Wonderings

Additional/Optional Resource:

N/A *Matter Matters Poetry*

Author: N/A

Genre: Poetry

Synopsis: This website contains eight different poems about matter. The poems are short and easy to read and can help students remember key matter concepts like the characteristics of solids, liquids, and gases.

Citation: Matter Matters Poetry (n.d.). Retrieved April 30, 2015, from http://www.tooter4kids.com/classroom/states_of_matter_poetry.htm

Cost/Access: \$0.00

Recommended Student Activities: Teacher and student read alouds

Supports for Struggling Students

By design, the **gradation of complexity** within each Expert Pack is a technique that provides struggling readers the opportunity to read more complex texts. Listed below are other measures of support that can be used when necessary.

- Provide a brief **student-friendly glossary** of some of the academic vocabulary (tier 2) and domain vocabulary (tier 3) essential to understanding the text
- Download the Wordsmyth widget to classroom computers/tablets for students to access student-friendly definitions for unknown words. <http://www.wordsmyth.net/?mode=widget>
- Provide brief **student friendly explanations** of necessary background knowledge
- Include **pictures or videos** related to the topic within and in addition to the set of resources in the pack
- Select a small number of texts to **read aloud** with some discussion about vocabulary work and background knowledge
- Provide **audio recordings** of the texts being read by a strong reader (teacher, parent, etc.)
- **Chunk the text** and provide brief questions for each chunk of text to be answered *before* students go on to the next chunk of text
- Pre-reading activities that focus on the **structure and graphic elements** of the text
- Provide **volunteer helpers** from the school community during independent reading time.

Why Text Sets Support English Language Learners

Those acquiring English as a second language have to learn many words in English to catch up with their English-only peers. Vocabulary builds at a much quicker pace when reading a set of connected texts. Text sets are an adaptable resource perfect for building knowledge and vocabulary. Student use of text sets can vary in terms of independence or teacher supports based on the individual needs of the students in the room. Activities found within the text set resources reflect several best practices for English Language Learner instruction including:

- Providing brief, engaging texts that provide a high volume of reading on a topic.
- Providing web-based resources and/or videos that are tied to the content of the texts students are reading.
- Providing opportunities for students to learn new vocabulary through the use of student-friendly definitions in resource-specific glossaries.
- Allowing for options to reinforce newly learned vocabulary and/or content through graphic organizers.
- Providing opportunities for students to reinforce new vocabulary through multi-modal activities including written work, group discussion, viewing visual content, and reading texts that feature the vocabulary.

Teachers of ELLs may use the protocols on the following pages to provide additional support to students who are struggling to access the content within text sets because they are new to English.

ELL Text Set Protocol Grades K-2

The protocol below assumes that students will be engaged in reading text sets with the support of the teacher and/or another adult staff member. This can be done full class, or in small groups, but will likely require adult support in this grade band.

Please note that this protocol includes options for teachers. This includes the order in which various activities (steps) take place. Individual decisions should be made considering the needs of the students and the demands of the content, keeping in mind that the goal of each scaffold is to allow students to meaningfully access each text and move toward independent, knowledge-building reading.

Step one: Build knowledge and vocabulary as you build student interest and engagement in the topic.

Introduce students to the overall topic/content of the text set, including knowledge demands needed to engage in the content, and domain-specific vocabulary necessary for comprehension. This should be done prior to engaging with the texts themselves – time allotted to this activity should reflect student needs (anywhere from 5 minutes prior to reading, to a full day’s lesson is appropriate).

Options for this step include:

- Engage students in reading and discussing auxiliary texts and resources (illustrations, photographs, video clips) on the topic of the text set.
- Pre-teach a few key content-specific terms prior to students engaging with a text set. (Ideas for text-focused vocabulary instruction can be found [here](#).)
- Provide a student-friendly glossary prior to reading each text, with picture support where possible.

If pairing the text set with a [Read Aloud lesson](#), giving students access to the resources in the text set can help build their knowledge and vocabulary prior to engaging with the anchor or primary text, as can access to the resources alongside subsequent reads of the anchor text. The “juicy sentence” discussion is a strategy developed by Dr. Lily Wong Fillmore to help students learn to deconstruct and reconstruct sentences, and to understand how different language features contribute to meaning. Teachers should use the [juicy sentence guidance](#) to dig deeply into a sentence or phrase within the read aloud book, to build vocabulary, deepen content knowledge, and support understanding of syntax and grammar. Juicy sentence work should not be done for the other texts in the text set, since the purpose is for students to work rapidly through a high volume of reading to build knowledge.

Step two: Read text orally.

Focusing on one resource at a time, allow students to listen to a fluent read of the resource.

Options for this step include:

- Have the teacher model the first read of a text or resource.
- Use recordings of the text to provide additional opportunities to hear expert reading.

Step three: Engage in group discussion about the content.

Allow students time in partnerships or small groups to discuss the content of the resource.

Options for this step include:

- Allow for discussion/conversation (in the students’ home language if possible) with a small group of students reading the same text set prior to writing or provide heterogeneous language groupings to talk about content and discuss what students are learning.
- Provide opportunities to practice using newly acquired vocabulary in the context of discussion.
- Have students refer to the student-friendly glossary included with each passage to identify meanings for new vocabulary necessary for comprehension.

Step four: Write about what was read.

Options for this step include:

- Use the “Rolling Knowledge Journal” and/or “Rolling Vocabulary Journal” as a shared writing routine.

- Have students complete the “Rolling Knowledge Journal” and/or “Rolling Vocabulary Journal” as independent graphic organizers that help to scaffold the writing process and capture student knowledge over time. Encourage students to use a combination of writing and drawing.
- Provide students with several supports to help students engage in writing/drawing about what they read:
 - Use mentor texts about which students can pattern their writing.
 - Allow them to write collaboratively.
 - Show students visual resources as prompts, etc.
 - Provide language supports such as strategically chosen sentence starters.

Repeat steps one through four with each resource in the text set as appropriate.

ELL Text Set Protocol Grades 3-12

The goal of text sets is to help students build knowledge through a volume of independent reading, and it is important that educators provide scaffolds to allow English Language Learners to be successful in engaging meaningfully with the texts, even as students are still developing English language skills. The protocol below can be used for teaching with text set resources as a full class. Students can also be trained on the protocol so that they can utilize text sets in small groups or partnerships as a resource for independent or reciprocal reading and study.

Please note that this protocol includes options for teachers. Individual decisions should be made considering the needs of the students and the demands of the content, keeping in mind that the goal of each scaffold is to allow students to meaningfully access the text and move toward independent, knowledge-building reading.

Step one: Build knowledge and vocabulary.

Introduce students to the overall topic/content of the text set, including knowledge demands needed to engage in the content, and domain-specific vocabulary necessary for comprehension. This should be done prior to engaging with the texts themselves; time allotted to this activity should reflect student needs (anywhere from 5 minutes prior to reading, to a full day’s lesson is appropriate).

Options for this step include:

- Engage students in reading and discussing auxiliary texts (of lesser complexity) and resources (illustrations, photographs, video clips) on the topic of the text set.
- Pre-teach a few key content-specific terms prior to students engaging with a text set. (Ideas for text-focused vocabulary instruction can be found [here](#).)
- Provide the student-friendly glossary included in the text set prior to reading each text.
- When possible, allow students to read texts in their home language about the topic under study.

Step two: Read text orally.

Focusing on one resource at a time, allow students to listen to a fluent read of the resource, while following along with their own copy of the text.

Options for this step include:

- Have a fluent reader model the first read of a text or resource.
- Have students engage in a buddy/partner read.
- Use recordings of the text to provide additional opportunities to hear expert reading.

Step three: Engage in group discussion about the content.

Allow students time in partnerships or small groups to discuss the content of the resource.

Options for this step include:

- Allow for discussion/conversation (in the students' home language if possible) with a small group of students reading the same text set prior to writing or provide heterogeneous language groupings to talk about content and discuss what students are learning.
- Have students refer to the student-friendly glossary included with each text set to identify meanings for new vocabulary necessary for comprehension.

Step four: Write about what was read.

Options for this step include:

- Use the “Rolling Knowledge Journal” and/or “Rolling Vocabulary Journal” as a shared writing routine/ graphic organizer to help to scaffold the writing process and capture student knowledge over time.
- Provide students with several supports to help students engage in writing/drawing about what they read:
 - Use mentor texts about which students can pattern their writing.
 - Allow them to write collaboratively.
 - Show students visual resources as prompts, etc.
 - Provide language supports such as strategically chosen sentence starters.

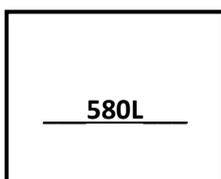
Repeat steps one through four with each resource in the text set as appropriate.

Text Complexity Guide

A Matter of Survival by Ann Weil

1. Quantitative Measure

Go to <http://www.lexile.com/> and enter the title of the text in the Quick Book Search in the upper right of home page. Most texts will have a Lexile measure in this database. You can also copy and paste a selection of text using the Lexile analyzer.



2-3 band	420 -820L
4-5 band	740 -1010L
6-8 band	925 - 1185L
9 -10 band	1050 – 1335L
11 – CCR	1185 - 1385

2. Qualitative Features

Consider the four dimensions of text complexity below. For each dimension*, note specific examples from the text that make it more or less complex.

<p>This informational text presents a problem of being stranded on a deserted island after a plane crash. The text emphasizes the importance of the properties of matter when choosing what materials to use that will help you survive. The states of matter, as well as mass, density, and volume are used to explain different characteristics of common solids, liquids, and gases.</p> <p style="text-align: right;">Meaning/Purpose</p>	<p>The text describes the properties of different types of matter found on the deserted island – from ocean water to coconuts to palm leaves. Photographs, captions, and a chart of properties appear on each page to explain how each type of matter is unique and support the reader’s understanding of the different matter being described. The sentences are varied, and include some compound and complex sentences.</p> <p>Structure</p>
<p style="text-align: right;">Language</p> <p>This book is text heavy with many words included within the text and the captions on each page. The sentences are varied, and include some compound and complex sentences. Content specific words are boldfaced (buoyant, physical change) and are supported with definitions at the bottom of every page.</p>	<p>Knowledge Demands</p> <p>The subject of the states of matter should be familiar to students since this is the last book of the expert pack. Students may need extra support to understand the properties of density and buoyancy, as well as how burning creates a chemical change in matter.</p>

3. Reader and Task Considerations

What will challenge students most in this text? What supports can be provided?

- Rereading, chunking, and discussion could support students with the large amount of text on some pages.
- Identifying and using various text features (photographs, captions, boldfaced words, and definitions) to help understand new vocabulary.
- Encouraging students to make connections to other texts in the set to deepen comprehension.

Expert Pack: What are the Properties of Matter?

Submitted by: Milwaukee Public Schools

Grade: 2-3

Date: March 2016

Learning Worth Remembering

Cumulative Activities – The following activities should be completed and updated after reading each resource in the set. The purpose of these activities is to capture knowledge building from one resource to the next, and to provide a holistic snapshot of central ideas of the content covered in the expert pack. *It is recommended that students are **required** to complete one of the Cumulative Activities (Rolling Knowledge Journal or Rolling Vocabulary) for this Expert Pack.*

1. Rolling Knowledge Journal

1. Read each selection in the set, one at a time.
2. After you read *each* resource, stop and think what the big learning was. What did you learn that was new *and important* about the topic from *this* resource? Write, draw, or list what you learned from the text about (topic).
3. Then write, draw, or list how this new resource added to what you learned from the last resource(s).

Sample Student Response

Title	Write, Draw, or List	
	New and important learning about the topic	How does this resource add to what I learned already?
1. <i>Beans to Chocolate</i>	Chocolate comes from cacao beans and the beans are turned into liquid, then it becomes a hard in a mold as it cools	
2. "Solids and Liquids"	Liquids and solids are states of matter and matter is everywhere	Chocolate is matter because it takes up space; it can be two different states of matter – a liquid and a solid
3. "A First Look: Solids, Liquids, and Gases"	There are three states of matter and matter can change into different states	A gas is another state of matter and it can also take up space
4. "Comparing Solids"	Solids can have different properties like color, size, and shape	Not all solids are the same and you can describe solids by what they look like and feel like
5. <i>Solids, Liquids, and Gases</i>	Inside our bodies, there are different states of matter - solids (bones), liquids (blood), and gas (air).	Some matter - like water - can change from a solid, to a liquid, and to a gas.

6. "States of Matter"	Liquids and gases do not have definite shapes because they spread out to fill the container they are in	Matter is anything that has weight and takes up space.
7. "Changing States of Matter"	Solids can become liquids by melting, liquids can become gases by evaporating.	Different types of energy, including heat, can change matter.
8. "Solids, Liquids, Gases"	The states of matter depend on how fast the molecules are moving.	Matter can change states depending on the temperature.
9. <i>A Matter of Survival</i>	Matter can go through physical and chemical changes.	Knowing about the properties of matter can help you know what matter is useful for.

2. Rolling Vocabulary: "Fantastic Four"

- Read each resource then determine the 4 words from each text that most exemplify the central idea of the text.
- Next use your 4 words to write about the most important idea of the text. You should have as many sentences as you do words.
- Continue this activity with EACH selection in the Expert Pack.
- After reading all the selections in the Expert Pack, go back and review your words.
- Now select the "Fantastic Four" words from ALL the word lists.
- Use the "Fantastic Four" words to summarize the most important learning from this Expert Pack.

Title	Four Vocabulary Words & Sentences
<i>Beans to Chocolate</i>	<p>Words: cacao beans, roasted, nibs, molds</p> <p>Sentences:</p> <ol style="list-style-type: none"> 1. Cacao beans are the seeds of the cacao tree used to make chocolate. 2. Dried cacao beans are roasted in an oven to bring out more flavor. 3. The nibs are the soft inside of a cacao bean after the shells are taken off. 4. The chocolate was poured into bar-shaped molds and became hard as it cooled.
"Solids and Liquids"	<p>Words: solids, liquids, matter, mass</p> <p>Sentences:</p> <ol style="list-style-type: none"> 1. Pencils, paper, rocks, and wood are all examples of solids. 2. Liquids, like water and milk, can be poured and take the shape of the container they are in. 3. Matter is everywhere and is anything that takes up space. 4. Mass is a measurement of how much matter is in an object
"A First Look: Solids, Liquids, and Gases"	<p>Words: gas, evaporation, water vapor, condensation</p> <p>Sentences:</p> <ol style="list-style-type: none"> 1. The air that we breathe is an example of a gas. 2. When a liquid heats up and changes to a gas, it is called evaporation. 3. Liquid water that has turned into gas is called water vapor.

	4. Condensation happens when water vapor is cooled and changes back into liquid water.
"Comparing Solids"	<p>Words: describe, properties, texture, compare</p> <p>Sentences:</p> <ol style="list-style-type: none"> 1. We had to describe the color and shape of the tennis ball. 2. The tennis ball had different properties than a bowling ball. 3. The texture of a tennis ball feels soft and fuzzy in my hand. 4. I compared the sizes of a tennis ball and a bowling ball - one is small enough to fit in one hand, but the other one is much larger and needs two hands to hold it.
<i>Solids, Liquids, and Gases</i>	<p>Words: melt, boil, steam, lungs</p> <p>Sentences:</p> <ol style="list-style-type: none"> 1. When ice heats up, it changes its state of matter and melts into liquid water. 2. Water begins to boil after it is heated up to a certain temperature. 3. When water is very hot, you can see steam, or water vapor, coming from it. 4. Our lungs help us to breathe and are filled with air.
"Changing States of Matter"	<p>Words: particles, energy, temperature, freezes</p> <p>Sentences:</p> <ol style="list-style-type: none"> 1. The small particles in a solid stay very close together and don't move around very much. 2. The sun gives off heat which is a type of energy. 3. When water boils, it needs to reach a temperature of 212 degrees Fahrenheit. 4. Liquid water can change to a solid when it freezes into ice.
"Solids, Liquids, Gases"	<p>Words: states of matter, molecules, boiling point, melting point</p> <p>Sentences:</p> <ol style="list-style-type: none"> 1. The three states of matter are solid, liquid, and gas. 2. The molecules in a gas move all around and do not stay in one place. 3. Water will change to a gas when it reaches its boiling point. 4. Ice has a melting point of 32 degrees Fahrenheit or 0 degrees Celsius.
<i>A Matter of Survival</i>	<p>Words: flexible, dissolves, physical change, chemical change</p> <p>Sentences:</p> <ol style="list-style-type: none"> 1. The branches were flexible enough to bend. 2. After salt dissolves in water, you cannot see it anymore but you can taste it in the water. 3. When matter changes from a solid to a liquid, it is a type of physical change. 4. After the wood burned in the fire, its properties changed and became a different type of matter, which is called a chemical change.
Fantastic Four	states of matter, properties, evaporation, condensation
<p>Summary: Matter is anything that takes up space. There are three states of matter: solid, liquid, and gas. Each type of matter has unique properties. A solid is usually hard and takes a particular shape. A liquid takes the shape of the container</p>	

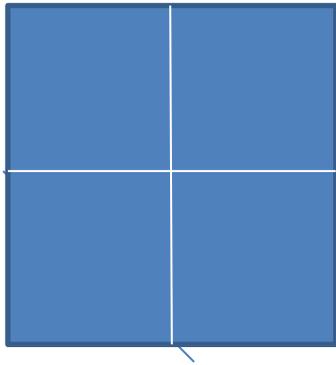
it is in. A gas has particles that can move freely. Matter can also change from one state to another. Liquids can change to a gas when the temperature rises which is called **evaporation**. **Condensation** is when a gas can change to a liquid as the temperature cools down. Water is one type of matter that can be in a solid, liquid, or gas state.

Learning Worth Remembering

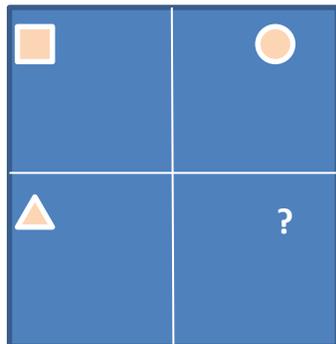
Singular Activities – the following activities can be assigned for each resource in the set. The purpose of these activities is to check for understanding, capture knowledge gained, and provide variety of ways for students to interact with each individual resource. Students may complete some or none of the suggested singular activities for each text. Singular activities should be assigned at the discretion of the teacher.

1. A Picture of Knowledge (“A First Look: Solids, Liquids, and Gases” and “Changing States of Matter”)

- Take a piece of paper and fold it two times: once across and once top to bottom so that it is divided into 4 quadrants.



- Draw these shapes in the corner of each quadrant.



1. Square
2. Triangle
3. Circle
4. Question Mark

3. Write!

Square:	What one thing did you read that was interesting to you?
Triangle:	What one thing did you read that taught you something new?
Circle:	What did you read that made you want to learn more?
Question Mark:	What is still confusing to you? What do you still wonder about?

- Find at least one classmate who has read [selection] and talk to each other about what you put in each quadrant.

2. Quiz Maker (Recommended for “Solids and Liquids”, “Comparing Solids”)

- Make a list of # questions that would make sure another student understood the information.
- Your classmates should be able to find the answer to the question from the resource.
- Include answers for each question.
- Include the where you can find the answer in the resource.

Question	Answer
1.	
2.	
3.	

3. Wonderings (Recommended for *Beans to Chocolate, A Matter of Survival*)

On the left, track things you don't understand from the article as you read.

On the right side, list some things you still wonder (or wonder now) about this *topic*.

I'm a little confused about:	This made me wonder:

4. Pop Quiz (Recommended for *Solids, Liquids, and Gases*)

Answer the following questions.

Question	Possible Answer
1. Matter can be a solid, liquid, or a gas. Which of these types of matter take up space?	Solids, liquids, and gases; they all do.
2. Name something solid in your body.	Bones, skull, teeth, heart
3. Name something liquid in your body.	Blood, saliva, urine
4. Your lungs are filled with _____. Is _____ a solid, liquid, or gas?	Air, gas

Expert Pack: What are the Properties of Matter?

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Expert Pack Glossary

Beans to Chocolate

<i>Word</i>	<i>Student-Friendly Definition</i>
Cacao beans	The seeds inside the pods that grow on a cacao tree used to make chocolate. <i>We went on a hike and saw a tree that grew cacao beans.</i>
Pod	Fruit that has seeds inside. <i>The fruit I ate could be considered a pod because it had a seed in it.</i>
Factories	A place where things are made by machines and people. <i>In the factory chocolate is made.</i>
Roast	To cook in an oven. <i>We had to roast the beans in the oven before eating them.</i>
Nib	The soft inside of a cacao bean after roasting that is used to make chocolate. <i>In the factory they use a nib from the cacao bean to make chocolate</i>
Liquid	A form of matter that can flow. <i>Chocolate can also become a liquid if it gets hot and melts.</i>
Mold	A container used to make a shape when a liquid is poured into it. The liquid cools and becomes hard and is now the shape of the mold. <i>The chocolate heart was made using a mold.</i>
Mixture	When two or more things are mixed together. <i>When you add flour and sugar it turns into a mixture.</i>

“Solids and Liquids”

<i>Word</i>	<i>Student-Friendly Definition</i>
Solid	

	A form of matter that has a firm shape and texture. <i>Chocolate becomes a solid when you freeze it.</i>
Matter	Anything that takes up space. <i>The water in a jar, which takes up space, could be considered matter.</i>
Mass	A measure of how much matter is in an object. <i>The mass of the chocolate candy was only 1 gram.</i>

“A First Look: Solids, Liquids, and Gases”

<i>Word</i>	<i>Student-Friendly Definition</i>
Gas	A form of matter that is not a solid or a liquid. <i>Fumes from a car are gas.</i>
Liter	A unit to measure a liquid. <i>My family drinks a 2 liter of soda with our pizza dinner.</i>
Quart	A unit used to measure liquid. <i>You can buy milk in a quart.</i>
Volume	The amount of space that an object uses. <i>The volume of the car gas tank is about 100 cubic inches.</i>
Beaker	A glass container used by scientists. <i>The scientists used a beaker to do the experiment.</i>
Evaporation	To turn from a liquid to a gas. <i>Water evaporates when you boil water.</i>
Water vapor	When water is heated and changes from a liquid to a gas.
Condensation	When a gas changes from a gas to a liquid. <i>My glass was cold and when I took it outside in the hot sun the outside began to have condensation.</i>

“Comparing Solids”

<i>Word</i>	<i>Student-Friendly Definition</i>
Properties	A way to describe objects by noticing color, shape, size, and texture. <i>Brown and hard are the properties of a cacao bean.</i>
Describe	To explain what something looks like, feels like, smells like, and sounds like. <i>I described the color of my shirt to my friend.</i>

Texture	How something feels. <i>The texture of the sand paper was rough.</i>
Compare	To explain how something is alike or different. <i>I compared myself with my friend, he was taller and I was shorter.</i>

Solids, Liquids, and Gases

<i>Word</i>	<i>Student-Friendly Definition</i>
Boil	When a liquid is heated and bubbles form in the liquid. <i>I boiled the water so I could make macaroni and cheese.</i>
Melt	To change from a solid to a liquid by heating. <i>If you leave the candy bar in the hot car the candy bar will melt.</i>
Steam	The gas that is made when water is heated to boiling. <i>The steam came off of my boiling water and disappeared into the air.</i>
Lungs	The body part that is used for taking in air and breathing. <i>My lungs hurt after I ran the mile.</i>

“Changing States of Matter”

<i>Word</i>	<i>Student-Friendly Definition</i>
Particle	A very small part of matter. <i>You can't see the particles in the air because they are too small.</i>
Temperature	How warm or cold something is which is measured in degrees. <i>The temperature outside is 80 degrees.</i>
Freeze	When a liquid becomes a solid. <i>You have to freeze water to get ice.</i>

"Solids, Liquids, Gases"

<i>Word</i>	<i>Student-Friendly Definition</i>
States of matter	The form that matter can take. <i>Everything has a specific state of matter.</i>
Molecule	A very small particle of matter. <i>The molecule was too small to see.</i>

Boiling point	The temperature when a liquid becomes hot enough to turn into a gas. <i>The water hit its boiling point and became so hot it began to bubble.</i>
Melting point	The temperature when a solid becomes a liquid. <i>The temperature hit the melting point and my chocolate began to melt.</i>

A Matter of Survival

<i>Word</i>	<i>Student-Friendly Definition</i>
Flexible	Able to bend easily. <i>The girl's body was very flexible, she could touch her toes.</i>
Life jacket	Vest to help you stay afloat in water. <i>We put on our life jackets when we got into the boat.</i>
Density	How much of a kind of matter there is in a certain space.
Dissolved	A solid that breaks apart and spreads throughout a liquid. <i>When you put sugar into water and boil it, it dissolves.</i>
Solution	A liquid with something dissolved in it. <i>When you mix salt and water it becomes a salt solution.</i>
Waterproof	Able to be used even if it gets wet. <i>I had to wear waterproof suntan lotion so I wouldn't get burned at the beach.</i>
Fuel	Anything that is burned to make heat or power. <i>We used the fuel to run our car.</i>
Energy	Ability to make a change happen, to do work. <i>It takes a lot of energy to run a marathon.</i>
Chemical change	When matter changes into a different kind of matter with different properties.
Physical change	When matter changes size or shape, but the properties stay the same. <i>My grandmother's physical shape changed when she started to diet, she got thinner.</i>
Buoyant	Able to float. <i>The boat was very buoyant.</i>