

Attainment's
EXPLORE

CHEMISTRY

Abby Davies
Angel Lee

INSTRUCTOR'S GUIDE



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By Abby Davies and Angel Lee

Edited by Shannon Booth

Graphic Design by Josh Eacret and Erin Radermacher

Video directed by Jeff Schultz & Ehren Schultz

Written by Abby Davies, Jeff Schultz, & Ehren Schultz

Motion graphics by Connie Beckham & Cole Steiner

Captioning by Larry Callahan

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Chapter 1

Matter and Change

| | |
|---------------------------|----|
| Getting Started | 16 |
| Vocabulary | 19 |
| Big Idea 1 | 22 |
| Big Idea 2 | 26 |
| Big Idea 3 | 30 |
| Big Idea 4 | 34 |
| Big Idea 5 | 38 |
| Discovery | 42 |
| Review/Quiz | 45 |

Introduction of Big Ideas

LEARNING OBJECTIVE:

Demonstrate an understanding of at least three Big Ideas.

MATERIALS:

water, ice, everyday examples of a solid, liquid, and gas (rock, bottle of water, balloon), metric ruler (showing cm and mm), **molecule models**, printed Big Ideas page, **Big Idea Cards**

Optional: printed Big Ideas page from Student Book, Big Idea Worksheet, Courseware Software; see UDL chart for additional ideas 

PREREQUISITE KNOWLEDGE:

Basic knowledge of matter (matter will be defined in this lesson as one of the Big Ideas, but the term is used before it is defined, students should understand the concept of things taking up space), atom, molecule, elements, metric system, volume, mass, distance

PREREQUISITE VOCABULARY:

combination, properties, measurement

LESSON PREP:

Review the general and lesson-specific UDL charts. Incorporate suggestions for Representation, Expression, and Engagement into lesson steps.

LANGUAGE BUILDER!

Use picture supports and point out important verbs, nouns, adverbs, and prepositions within big ideas.

Matter makes up the stuff around us and **takes up space**.

All **matter** is made of **atoms**.

Molecules are a **combination** of two or more **atoms**.

Elements have **different properties**.

Chemistry uses the **metric system** of measurement.

UNIVERSAL DESIGN FOR LEARNING

| Representation <i>Resourceful, knowledgeable learners</i>  | Expression <i>Strategic, goal-directed learners</i>  | Engagement <i>Purposeful, motivated learners</i>  |
|---|--|---|
| <ul style="list-style-type: none"> Use everyday examples of matter in all 3 states. Show both living and nonliving examples. Show everyday examples of elements (silver, sodium). | <ul style="list-style-type: none"> Preprogram AAC devices with words like <i>matter</i>, <i>mass</i>, and <i>atom</i>. Provide response options when needed. Rather than answering verbally, allow students to complete the Big Idea Worksheet. | <ul style="list-style-type: none"> Encourage each student to contribute at least one question to the KWL chart. Practice measuring using the metric system. Have students make a statement about matter using “I think/because”. |
| Provide supports for important words in the text. Nouns Verbs Adjectives | | |



Examine It!



Language Builder!



Challenge!



OVERVIEW

INTRODUCTION Follow along

Today we will begin the Chemistry course. Listen. Chemistry studies matter and how it changes. What does chemistry study? Confirm correct responses. Model correct answer if needed.

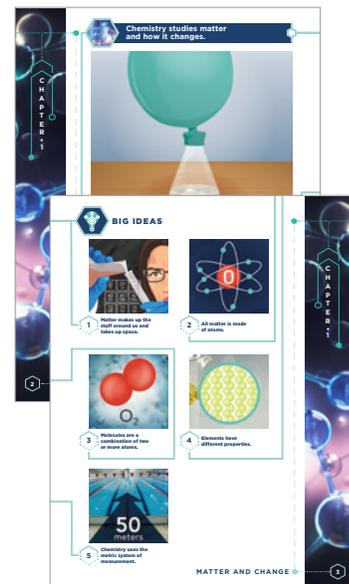
Your chemistry book is broken down into units of study. Each unit will have two chapters. Unit 1 is called Exploring Chemistry.

As we make our way through this course, each chapter will follow the same order. We will begin with a lesson that focuses on the Big Ideas for the chapter. These are the main ideas and the most important information to learn. Then we will have a vocabulary lesson, where you will learn words that are important in the chapter, and what those words mean. After the vocabulary lesson, we will learn more about each Big Idea for the chapter. Each Big Idea also has a “Did you Know?” section that tells an interesting fact related to the Big Idea. At the end of each Big Idea lesson, we will practice answering questions from the end of chapter quiz. There will be five Big Idea lessons. The sixth lesson in every chapter will be a Discovery lesson. The Discovery lessons give us a chance to learn interesting facts and to see how chemistry affects our daily lives. Finally, the last lesson in every chapter will be a quiz. But remember, we will practice the quiz questions along the way.

We may repeat lessons, especially the vocabulary and Big Idea lessons.

Find Chapter 1 in your book. The title of Chapter 1 is *Matter and Change*. Describe the image on page 1. Let students know that these are atoms bonded together as molecules. These things make up matter, and everything around us. Point to several things in your environment and label them as examples of matter.

Everything around us is matter and matter can change. One common example is how water changes to ice when it freezes. Show an example of water and ice. We will discuss this in more detail in this chapter.



ACTIVATE PRIOR KNOWLEDGE KWL chart

Let's begin by talking about what we already know. We will use a graphic organizer called a KWL chart.



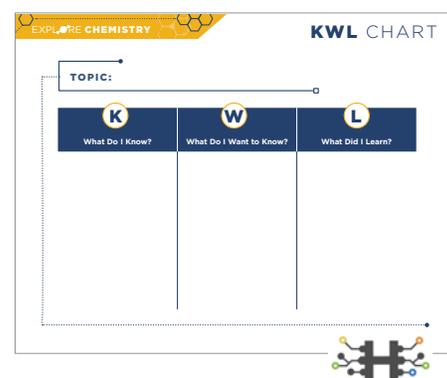
Assess students' basic knowledge of matter and chemistry by asking questions. As students offer what they know, add a few facts to the “What Do I Know?” or “K” column of the KWL chart. If students are not able to demonstrate the needed prerequisite knowledge, provide some or all of the facts suggested below. Review the facts listed before moving on.

What do you want to know about matter or chemistry? Record responses under the “What Do I Want to Know?” or “W” column. Be sure that at least one question will be answered in the chapter content.

One way that we can answer these questions is to read about the topic. As we read this chapter, we can check back to see if any of our questions have been answered. If they are, we will list the answers in the last column on the graphic organizer, the “L” column. “L” stands for “What Did I Learn?”

This activity is meant to assess knowledge of basic facts such as:

- Matter is everything around us that takes up space and has mass.
- Mass is how much matter something has.
- All matter is made of atoms.
- Volume, mass, and distance can be measured.



GETTING STARTED

EXPLORE

THE BIG PICTURE Follow along

Turn to page 2 in your book. Point to text as you read the title for the Big Picture. **Chemistry studies matter and how it changes. That's what we will do in this course. We will study matter and how it changes. What was the example of how matter changes that I gave you already?** If needed, remind students of the example using liquid water and ice.

Point out the Big Picture on page 2. **This image shows matter and how it changes. The beaker has a liquid in it. The balloon is full of gas. The diagram below it shows us how matter changes from solid, to liquid, to gas, and from gas, to liquid, to solid. We will discuss this a lot more as we go on.**

Point to the diagram representing the solid. Confirm correct responses. Model if needed.

BIG IDEAS Follow along

Listen while I read each Big Idea. Remember, this is the most important information for Chapter 1. As you read, point to each Big Idea so that students can see. Remember to refer to the UDL chart for suggestions to increase learning potential. This will be especially important since the overview lesson comes before the vocabulary lesson.

You may choose to ask students to point to each Big Idea in their books as you read it, or you may allow them to focus on oral comprehension.

Read each Big Idea. Elaborate as needed, providing examples or visuals.

-  **Examine It!** Use the provided molecule models to represent atoms and molecules. (Show Na or Cl separately to represent an atom. Put two or more atoms together with the magnet to represent the molecule or use the provided water molecule.)

Good listening.

CHECK FOR UNDERSTANDING Answer questions

Now I will go back through the Big Ideas again. This time, I will ask a question after each one. Read each Big Idea once or even twice more. After each Big Idea, ask the corresponding question below.

- 1. What makes up the stuff around us and takes up space?**
- 2. What is all matter made of?**
- 3. What are molecules a combination of?**
- 4. What have different properties?**
- 5. What measurement system does chemistry use?**

If needed, follow a Least Intrusive Prompting (LIP) hierarchy until the student reaches the correct answer. (1) Verbal. Reread the Big Idea. Re-ask. (2) Model. Model providing the correct answer. Re-ask. (3) Physical Guidance. Guide the student to the correct response.

Refer back to the KWL chart to see if any questions have been addressed. If so, review the question and see if the students can complete the L portion of the chart.



CLOSING

Great job answering questions about the Big Ideas. We will learn more about each Big Idea in upcoming lessons.

Vocabulary

OBJECTIVE:

Gain exposure to new scientific vocabulary.

MATERIALS:

molecule models, Vocabulary Cards, Model-Lead-Test Procedure Card, Time-Delay Procedure Card, Vocabulary Worksheet

Optional: photos and/or objects to represent vocabulary, Word Search Activity; see UDL chart for additional ideas 

PREREQUISITE KNOWLEDGE:

Basic knowledge of matter and measurements, solid, liquid, gas, elements

PREREQUISITE VOCABULARY:

properties, simpler, substance, centimeter, gram, force

LESSON PREP:

Review the general and lesson-specific UDL charts. Incorporate suggestions for *Representation*, *Expression*, and *Engagement* into lesson steps.

UNIVERSAL DESIGN FOR LEARNING

| <p>Representation <i>Resourceful, knowledgeable learners</i></p>  | <p>Expression <i>Strategic, goal-directed learners</i></p>  | <p>Engagement <i>Purposeful, motivated learners</i></p>  |
|--|--|---|
| <p>Varying ways to represent vocabulary:</p> <ul style="list-style-type: none"> As presented in Student Book Supported by: illustrations or photographs (e.g., atom, models, everyday objects representing the three states of matter, videos on density) Examine It! Use the provided molecule models to represent an atom and a molecule | <ul style="list-style-type: none"> When using Time-Delay, choose an expressive or receptive format. If a receptive format is chosen, response options include, but are not limited to, pointing, pull-offs, eye gaze. Use picture supports and synonyms. Have students create different versions of the definitions using synonyms for the words in the definitions. | <ul style="list-style-type: none"> Choosing the strategy best suited for your students will increase engagement. Using the appropriate form of vocabulary (see <i>Representation</i>) will lead to increased engagement. Vary what you consider to be acceptable performance for this lesson. Not all students will learn and maintain ten vocabulary words. |
| <p>Provide supports for important words in the text. Nouns Verbs Adjectives</p> | | |



Examine It!



Language Builder!



Challenge!

VOCABULARY

INTRODUCTION Follow along

Ask students to turn to page 4 in their book. **Today our lesson starts on page 4, Chapter 1, which will be a vocabulary lesson.**

There are ten vocabulary words per chapter. Decide if you will teach all ten words in one lesson or teach sets of words per lesson. Repeat these lessons if needed.

CHOOSE YOUR STRATEGY Learn vocabulary

Model-Lead-Test

Note: This strategy requires the student to respond verbally.

If you choose this strategy, use the provided **Model-Lead-Test Procedure Card**, or follow this procedure:

Model: Listen. The word *mass* means the amount of matter an object has.

Lead: Say it with me. *Mass* means the amount of matter an object has.

Test: What word means the amount of matter an object has? Student answers “mass”.

Repeat with each vocabulary word.

Time-Delay

Use provided Vocabulary Cards and the **Time-Delay Procedure Card**. Teach the words in sets of four (2 cards will repeat). It may not be realistic to teach multiple sets in one lesson. 



When teaching vocabulary, use picture supports and point out important verbs, **nouns**, and **adjectives** within the definitions. Give synonyms when possible. Use the vocabulary word in a sentence and repeat the sentence with the synonym.

| VOCABULARY | | VOCABULARY | |
|---------------------|--|------------|---|
| CHAPTER 1 |  Mass The amount of matter an object has | CHAPTER 1 |  Compound Two or more elements held together by a chemical bond |
| |  Atom The smallest part of matter that keeps all its properties | |  Density How much space an object takes up compared to its mass |
| |  Element Matter that cannot be broken down into a simpler substance | |  Periodic table A table of all chemical elements in order of atomic number |
| |  States of matter The different forms of matter, including solid, liquid, and gas | |  Meter How length is measured in the metric system, equal to 100 centimeters |
| |  Chemical bond A force that holds atoms or molecules together | |  Kilogram How mass is measured in the metric system, equal to 1,000 grams |
| 4 EXPLORE CHEMISTRY | | | MATTER AND CHANGE 5 |



WRITE ABOUT IT

WORKSHEET Complete worksheet

Use the editable vocabulary writing page to create a Vocabulary Worksheet appropriate for each student. Provide students with the printed worksheet. 

Now that we have gone over all of the vocabulary words for this chapter, you have a Vocabulary Worksheet to complete. Your worksheet has five words in the word bank. Five definitions are below. Complete the worksheet by writing the vocabulary word next to the correct definition.

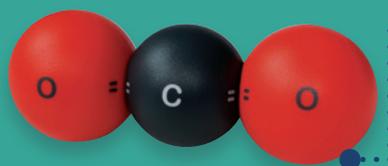
Students may:

- Complete the Vocabulary Worksheet independently and turn it in for teacher feedback.
- Complete the worksheet by pasting prewritten vocabulary words by the correct definition. If needed, words and definitions should be read aloud by a teacher or peer.
- Scribe to a teacher or peer to complete the worksheet.

CLOSING

Refer back to the KWL chart to see if any questions have been addressed. If so, review the question and see if the students can complete the L portion of the chart.

Great job with the vocabulary words! We will review vocabulary words again as we read each Big Idea.



EXAMINE IT! *Integrate the molecules into your lesson.*

- Use the provided molecule models to represent an atom and a molecule.



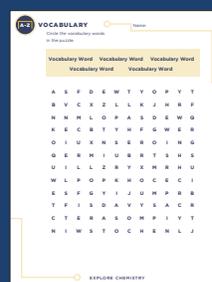
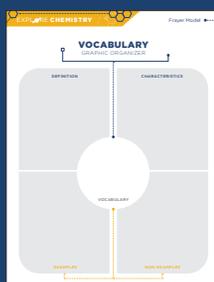
REAL-WORLD CONNECTIONS

- Use everyday objects to represent vocabulary words, like examples of all three states of matter and a metric ruler.



EXTENSION ACTIVITIES

- If repeating this lesson over multiple days, choose 2-3 words per day to support a deeper understanding of the vocabulary. *Discuss pros and cons, watch related videos, or locate photographs.*
-  **Language Builder!** Complete a Frayer Model graphic organizer (found on the HUB) for vocabulary words.
-  **Write About It!** Use the editable Word Search writing page (found on the HUB) to create a Word Search activity for students to complete.





Matter makes up the stuff around us and takes up space.

LEARNING OBJECTIVES:

1. Matter is anything that has mass and takes up space.
2. Matter can change.

MATERIALS:

Vocabulary Cards for *mass* and *atom*; **molecule models**, **Big Idea Card**

Optional: photos and/or objects to represent vocabulary words, printed Big Ideas page from **Student Book**; see UDL chart for additional ideas

PREREQUISITE KNOWLEDGE:

Basic knowledge of matter and measurements, living vs. nonliving things

PREREQUISITE VOCABULARY:

observation, experiment, discover, properties

LESSON PREP:

Review the general and lesson-specific UDL charts. Incorporate suggestions for *Representation*, *Expression*, and *Engagement* into lesson steps.

WHAT TO EXPECT:

Watch for these language-building opportunities throughout the lesson.

Offer synonyms for keywords in the reading.

Have students give their answer in a declarative statement.

UNIVERSAL DESIGN FOR LEARNING

| Representation <i>Resourceful, knowledgeable learners</i> | Expression <i>Strategic, goal-directed learners</i> | Engagement <i>Purposeful, motivated learners</i> |
|---|--|---|
| <ul style="list-style-type: none"> • Bring in everyday examples of matter. • The term <i>properties</i> will be used often in this text. Plan for multiple opportunities for students to use the term <i>properties</i> in sentences and to practice describing properties of matter. | <ul style="list-style-type: none"> • Offer the opportunity to answer yes/no as an alternative to using an array of response options. • Student presentations can be completed using prerecorded VOD or partial participation. • For discussions, provide photographs or videos for ideas. Preprogram VODs or create communication boards. | <ul style="list-style-type: none"> • Provide students with vocabulary cards or a vocabulary list. Ask students to point to/circle/check off vocabulary as it is read within the passages. • Watch the video <i>Science Experiments: Magic Gas</i>, found on the STEM Learning Channel on YouTube. |
| Provide supports for important words in the text. Nouns Verbs Adjectives | | |



Examine It!



Language Builder!



Challenge!



INTRODUCTION

BIG IDEA Follow along

This chapter is called “Matter and Change”. First, we reviewed the five Big Ideas in this chapter. Show the printed page of all the Big Ideas or hold up a Student Book and show page 3 to the students, pointing to Big Idea 1. Show the Big Idea Card. In the next few lessons, we will learn more about each Big Idea. Listen to the first Big Idea. Matter makes up the stuff around us and takes up space. Repeat if needed.



VOCABULARY Identify vocabulary words

Let’s review the two vocabulary words that we will see in this passage.

Review the vocabulary words and definitions for *mass* and *atom*. Make sure students have a good understanding of the vocabulary words before reading the content.

COMPREHENSION Follow along

Turn to page 6 in your chemistry book. Read the title. “Matter makes up the stuff around us and takes up space.”

Ask students to show you an example of matter. Model if needed.

Point out the corresponding image and read the caption. **Chemists do experiments to understand the world around us.** Point to the chemist and the experiment she’s performing.

Point to the chemist in the image. Reinforce correct responses. If needed, model pointing to the chemist. Re-ask.

CHAPTER 1

Matter makes up the stuff around us and takes up space.

Chemists do experiments to understand the world around us.

Chemistry explains the world we live in and how things work. Everything involves chemistry—living and nonliving things, our food, and our clothes. It is the study of matter and how matter changes. Matter is anything that has **mass** and takes up space. Chemists make observations about the world around them and then use experiments to discover why things are the way they are.

Mass

The amount of matter an object has

Everything around us is made of tiny atoms.

The water you drink is matter.

Matter is made up of tiny **atoms**, which will be discussed in detail in future chapters. Matter can look different at certain temperatures. It can also combine with other matter. Certain properties of matter can be seen, like its color, while experiments must be done to find out other information.

Atom

The smallest part of matter that keeps all its properties

DID YOU KNOW?

Sometimes matter is so tiny that you can't see it without using a tool, like a microscope. Some things are so small they can't even be seen with a microscope.

CHAPTER 1

6 EXPLORE CHEMISTRY
MATTER AND CHANGE 7

LESSON 1

EXPLORE

READ  *Follow along*

Listen while I read the passage on page 6. Follow along in your book. In your chemistry book, vocabulary will be in bold text, like this. Point out **mass**.

Read the passage. 



Offer synonyms for words such as *observations* and *discover*.

COMPREHENSION  *Answer question*

Here is an image of tiny atoms inside of a coin. Point to the image. Read the caption for the image, text pointing as you read. This is called a caption. The caption describes the image. Listen to the caption again. Read the caption a second time.

What is everything around us made of? Reinforce correct responses. If needed, use a Reread prompt. The Reread prompt should begin with a nonspecific verbal prompt, meaning you want to provide more information than simply the correct answer. In order to do that, you will need to add a sentence or two to your prompt. For example: (1) Non-specific Verbal. **Chemists use experiments to discover why things are the way they are. Everything around us is made of tiny atoms.** Re-ask. (2) Specific Verbal. **Listen. Everything around us is made of tiny atoms.** Re-ask. (3) Model choosing the correct response. This would only be needed if you are providing response options. 



Have students give their answer in a declarative statement.

READ  *Follow along • Answer question*

Turn to page 7 in your book. Follow along while I read and listen for the other vocabulary word, **atom**.

Read the passage. Talk about properties in relation to the five senses. Explain that properties are the same as characteristics. Show several objects and ask students what the properties are. Be sure students include the states of matter. If needed, ask guiding questions. **How does this object feel? Can you see through it?**

DEEPER UNDERSTANDING  *Watch video • Answer question*

Let's look at the image at the top of page 7. The caption says, "The water you drink is matter". Point to text as you read. This image shows a person pouring a glass of water. The water is matter. What else in the image do you think is matter? Point out that the sink, hand, plant, and windowsill are all matter. Ask, **Since they are all matter, what are they all made of?** Confirm correct responses. If needed, go back to the image on the previous page and read the caption.

Let's watch a video about matter. Use the QR code to access a video clip about matter.

Ask students one or two questions about the video or ask one thing that was learned. Reinforce and confirm correct responses. If needed, use LIP. A suggested hierarchy would be (1) Verbal—listen to video, (2) Model, and (3) Physical guidance.



CHECK FOR UNDERSTANDING

QUIZ  *Answer at least one quiz question*

Now, let me ask you two questions. I will read the question and then I will give you three choices.

Ask Q1 from the quiz on page 17 of the Student Book. **What does chemistry study?** Provide choices from the quiz. Ask Q2 from the quiz. **What can make matter look different?** Provide choices from the quiz. Confirm correct responses. If needed, return to the text, and provide the Reread prompt. Remember the hierarchy: (1) Non-specific Verbal; re-ask. (2) Specific Verbal; re-ask. (3) Model selecting correct answer if using response options; re-ask.

Refer back to the KWL chart to see if any questions have been addressed. If so, review the question and see if the students can complete the L portion of the chart.



APPLY

DID YOU KNOW? Engage in discussion

Look at the bottom of page 7, at the section called “Did You Know?” Point to the title. Read the content.

What do you think is something that is so small you need to use a microscope to see it? Encourage students to respond verbally or through prepared response options. If needed, model a Think Aloud. For example, say, **Do you think you could see more details on a grain of sand if you look at it under a microscope? What about sugar, salt, or a piece of hair? Can you think of anything that’s even smaller than that?** You might provide hints related to things that are completely invisible to the human eye but are visible with a microscope (microscopic organisms, cells). Reinforce and confirm relevant responses.

If possible, bring a microscope to class and have students look at something very small in detail. Discuss how matter can be big and small things, and visible and invisible things.

CLOSING

Before we complete this lesson, let’s review the Big Idea again. Students may:

- Read the Big Idea from page 3.
- Assist in reading the Big Idea by reading select words.
- Select the Big Idea from an array of sentences.
- Select the photo from page 3 that illustrates the Big Idea.



REAL-WORLD CONNECTIONS

- Choose a famous chemist to research. Provide graphic organizers to record information as a class or individually. Have students present on what the scientist discovered.
- Explore the various types of jobs related to chemistry. What type of training do they require? Discuss whether or not any students might be interested in this field of work.
- Collaborate with the chemistry teacher at your school. Ask the chemistry teacher to come and speak to your class about chemistry and what chemists do, or see if your students can visit the chemistry classroom to see the equipment and see a demonstration.



EXTENSION ACTIVITIES

- Explain mass and the conservation of matter through an experiment. Have students guess if popcorn will have more or less mass after popping. First, weigh a bag of pre-popped popcorn. Then, pop the popcorn in a microwave. Weigh the popcorn again. The popped popcorn will weigh less. The popcorn, however, now takes up a lot more space than when it was pre-popped. When you open the popcorn bag, some steam escapes. This steam also is matter! This is why some mass decreases.
- Discuss the Scientific Method. Choose a topic related to chemistry to walk students through the Scientific Method.

Discovery

LEARNING OBJECTIVES:

1. Things that are less dense than water will float on water.
2. Salt water is more dense than fresh water.

MATERIALS:

Discovery Worksheet, molecule models, bucket of liquid water, salt, coin, sponge, apple, marble, can of soda, can of diet soda, uncooked egg (or any similar materials you may have) 

PREREQUISITE KNOWLEDGE:

density, compounds, float vs. sink

PREREQUISITE VOCABULARY:

Salt water, fresh water

LESSON PREP:

Review the general and lesson-specific UDL charts. Incorporate suggestions for *Representation*, *Expression*, and *Engagement* into lesson steps.

UNIVERSAL DESIGN FOR LEARNING

| Representation <i>Resourceful, knowledgeable learners</i>  | Expression <i>Strategic, goal-directed learners</i>  | Engagement <i>Purposeful, motivated learners</i>  |
|--|---|---|
| <ul style="list-style-type: none"> • Use models to support the content. • Provide multiple examples of the density of different objects vs. water. • Illustrate density. • Examine It! Use the provided molecule models to show students a NaCl (sodium chloride) compound. | <ul style="list-style-type: none"> • Offer the opportunity to answer yes/no as an alternative to pointing to a named image (e.g., Is this a sodium atom?) • Use word banks and synonyms and highlight important nouns/underline important verbs. | <ul style="list-style-type: none"> • Illustrate density in a real-world context. |
| Provide supports for important words in the text. Nouns Verbs Adjectives | | |

**Examine It!****Language Builder!****Challenge!**



DISCOVERY

PART 1 Follow along • Answer question

Turn to page 16 in your book. Let's read the title question. Why do some things float on water and others sink? See if any student remembers the answer from the chapter text.

Look at this image at the top of the page. Point to the image. This image shows a beach ball floating on liquid water. Why do you think the beach ball can float? Is the beach ball more or less dense than water? Confirm correct responses. If needed, use LIP.

In this lesson, we will answer that question as we learn more about density. Remember that density is how much space an object takes up compared to its mass, and that mass is how much matter the object has.

Follow along while I read the passage and listen for the answers to our questions. Point to the text as you read.

Ask, Which of these things do you think will float on water: a coin, a sponge, an apple, a marble, a can of soda, and a can of diet soda? Allow students to make a prediction. Record predictions. Let's try it out! Fill a large container with fresh water and add these items one by one. Take note of if they float or sink. Then, ask, Are you surprised? What does this tell you about the density of each object? Reinforce correct answers. If needed, perform the experiment again, showing students that denser objects sink.

PART 2 Follow along • Answer question

The title of this next section is "Do you think the same things that float on fresh water will also float on salt water in the oceans?" Use this question as a discussion point. Model a Think Aloud to show how you use what you know to try and answer questions. For example, you know that density impacts whether an object will sink or float, so do students believe salt is more or less dense than water? Then, is salt water more or less dense than fresh water?

Read the second passage and have students follow along as you read.

Model the activity again. Add an uncooked egg to the same container of water that you used before. Ask, Does the egg sink or float? Does that mean it is less or denser than the fresh water? Now, add some salt to the water. Ask, Does the egg sink or float in the salt water? What does this tell us about salt? Is it more or less dense than water? So, will the same things that float or sink in fresh water also float or sink in salt water? Reinforce correct responses. If needed, use LIP. (Tip: If the egg doesn't float in the salt water, you have to add more salt. Keep adding salt until the egg floats. This addition of extra salt can help show students the concept of density in a real-world context.)

Look at the other image on the page. Point to the image. Do you remember what a compound is? It's a molecule made of atoms of different elements. This shows NaCl, or sodium chloride. Sodium is one element, and chlorine is another. Together they make the compound sodium chloride. The caption says, "The compound sodium chloride is found in ocean water." Sodium chloride makes salt. Point to each atom and name them. Sodium's symbol is Na. Can you point to sodium? What does Cl stand for?

CHECK FOR UNDERSTANDING Answer questions

Ask students, Why do some things float on water, and some things sink? Do the same things that float on fresh water also float on salt water? Confirm correct responses. If needed, use LIP.

THINK-ALoud QUESTION

Have you ever wondered why certain things, like beach balls, float on water, while other things, like rocks, immediately sink?

Have you ever gone to the beach or pool and noticed that something was able to float? What was it?

Have you ever floated in water?

Have students discuss.



Offer synonyms for words such as following and container.

DISCOVERY

Why do some things float on water and others sink? Think about which of the following you believe will float on water: a coin, a sponge, an apple, a marble, a can of soda, and a can of diet soda. Let's try it out. Fill a large container with water and add these items to it. Are you surprised? What does this tell you about the density of each object?

Many pool toys float on water.

The compound sodium chloride is found in ocean water.

Do you think the same things that float on fresh water will also float on salt water in the oceans?

Salt water has a higher density than the fresh water you drink. Does this mean that more or less objects will float on salt water? Let's try it out again! Add an uncooked egg to the same container of water that you used before. What do you notice? Does it sink or float? Now, let's add some salt to this water. Does the egg sink or float? What does this tell you about salt? Is it more or less dense than water?

EXPLORE CHEMISTRY

DISCOVERY

WRITE ABOUT IT

WORKSHEET Complete worksheet

Use the editable Discovery writing page to create a writing prompt appropriate for each student. Provide students with the printed or digital worksheet. 

Now that we know more about density, let's write about it! Here is your worksheet to complete. If needed, read the writing prompt.

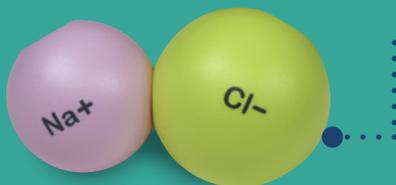
Students may:

- Complete the Discovery Worksheet independently and turn it in for teacher feedback.
- Have the prompt read by a teacher or peer. Complete the worksheet by pasting prewritten sentences onto the sheet.
- Scribe to a teacher or peer to complete the worksheet.
- Have two plausible, but different, responses read aloud and select a response to complete the worksheet.
- Use a word bank provided by the instructor to add verbs, nouns, and prepositions to fill-in-the-blank sentences.



CLOSING

This lesson taught us a lot about density! We also learned some interesting facts about fresh and salt water. After we take a quiz, our next chapter will teach us even more about the states of matter!



EXAMINE IT! *Integrate the molecules into your lesson.*

- Use the provided molecule models to show students a NaCl (sodium chloride) compound.



REAL-WORLD CONNECTIONS

- Connect the activities in class to a real-world context of oceans vs. fresh water. Introduce the concept of potable fresh water vs. undrinkable salt water. Discuss how some things may float in the ocean if you lose them (like flip flops). Talk about how swimming in salt water may feel different from swimming in fresh water. Discuss and show images of the Dead Sea. It is a salt lake that is so dense people float instead of swim. Check for understanding.
- Use a globe to show students that most of Earth is oceans. However, we cannot drink ocean water. Remind students that the sodium chloride compound is in salt. Salt water doesn't help hydrate humans.



EXTENSION ACTIVITIES

- Have students choose objects whose density they are curious about. Try testing if they are more or less dense than fresh and salt water. Try a density activity with a liquid other than water.

Review/Quiz

WRITE ABOUT IT!

CHOOSE THE METHOD THAT WORKS FOR YOU.

- Have students complete the Big Idea Worksheet independently. 
- Read each Big Idea sentence, along with the response options to the student. Allow the student to answer verbally or select a response option.

Students may opt to give their answers out loud, instead of writing them down. Have them use declarative statements.

REVIEW

Prepare for the quiz by reviewing the Big Idea and Vocabulary Cards for the chapter.

QUIZ

CHOOSE THE PROCEDURE THAT WORKS FOR YOU.

- Have the students take the quiz in the consumable Student Workbook independently.
- Read the questions and choices to the students and have them circle or point to their answers.
- Use the quiz as a chapter review and not as a comprehension assessment.

The quiz is also available in two digital formats: PDF and GoWorksheet for use with the free **GoWorksheet iPad App**.

1. Print out the quiz with symbols from the PDF for the students who need picture representation to assist with comprehension.
2. Have the students take the quiz without the symbols (PDF only) after the book quiz as a review.
3. Have students only take the quiz with the **GoWorksheet iPad App**.

