Science Notebook

Glencoe Science

Active Reading Note-taking Guide

Science Grade 8

Consultant
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Note-Taking Tips

Your notes are a reminder of what you learned in class. Taking good notes can help you succeed in science. These tips will help you take better notes.

- Be an active listener. Listen for important concepts. Pay attention to words, examples, and/or diagrams your teacher emphasizes.
- Write your notes as clearly and concisely as possible. The following symbols and abbreviations may be helpful in your note-taking.

Word or Phrase	Symbol or Abbreviation
for example	e.g.
such as	i.e.
with	w/
without	w/o

Word or Phrase	Symbol or Abbreviation
and	+
approximately	≈
therefore	∴
versus	vs

- Use a symbol such as a star (★) or an asterisk (*) to emphasis important concepts. Place a question mark (?) next to anything that you do not understand.
- Ask questions and participate in class discussion.
- Draw and label pictures or diagrams to help clarify a concept.

Note-Taking Don'ts

- **Don't** write every word. Concentrate on the main ideas and concepts.
- **Don't** use someone else's notes—they may not make sense.
- **Don't** doodle. It distracts you from listening actively.
- **Don't** lose focus or you will become lost in your note-taking.

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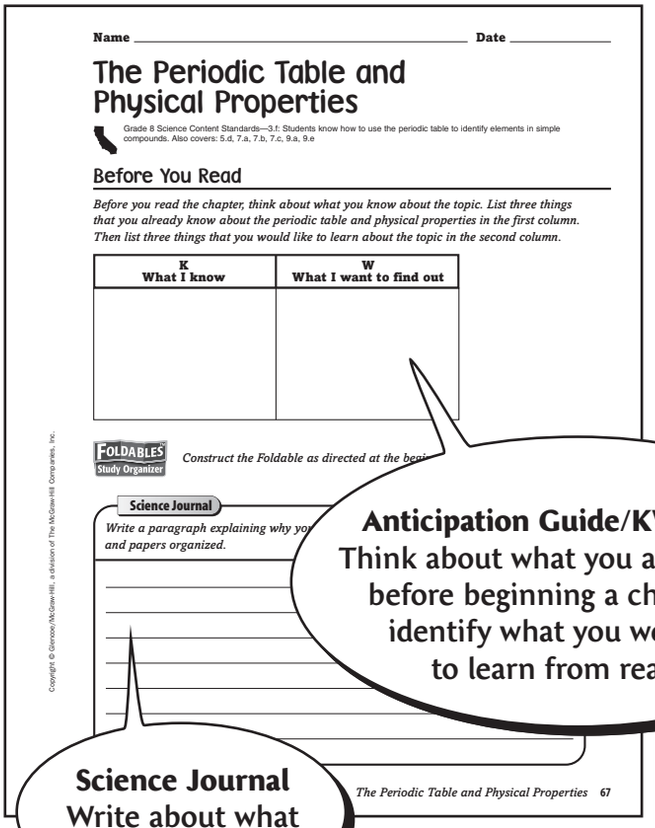
Using Your Science Notebook

This note-taking guide is designed to help you succeed in learning science content. Each chapter includes:

Language-Based Activities
Activities cover the content in your science book including vocabulary, writing, note-taking, and problem solving.



Name _____ Date _____

The Periodic Table and Physical Properties

Grade 8 Science Content Standards—3.f: Students know how to use the periodic table to identify elements in simple compounds. Also covers: 5.d, 7.a, 7.b, 7.c, 9.a, 9.e

Before You Read

Before you read the chapter, think about what you know about the topic. List three things that you already know about the periodic table and physical properties in the first column. Then list three things that you would like to learn about the topic in the second column.

K What I know	W What I want to find out

FOLDABLES Study Organizer *Construct the Foldable as directed at the beginning of the chapter.*

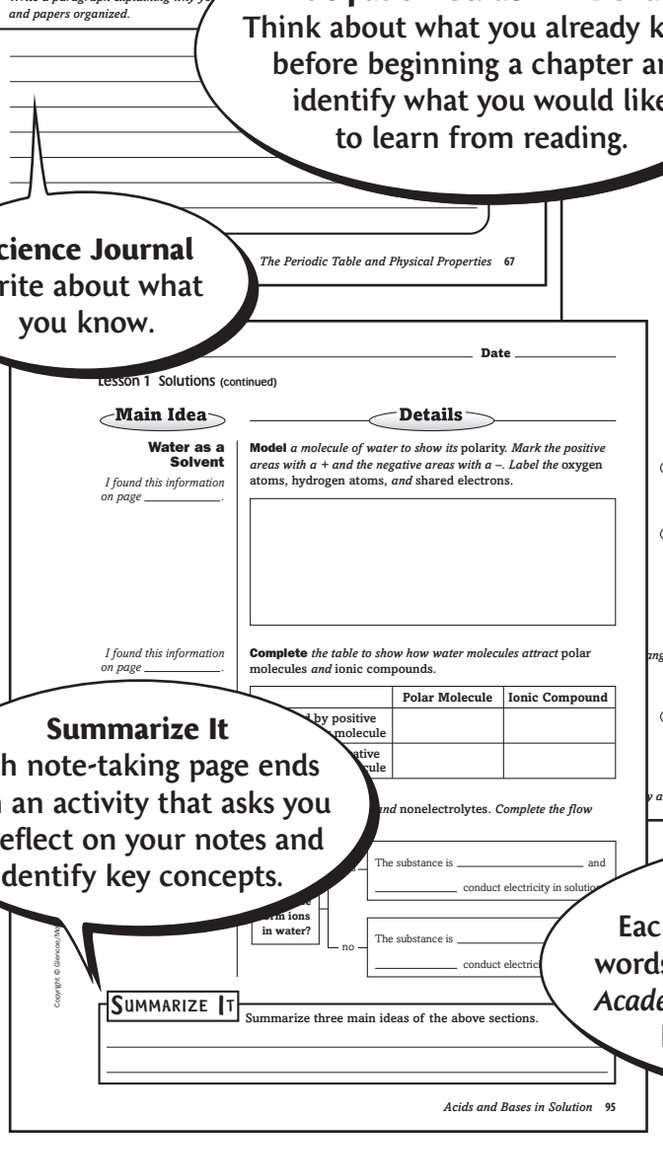
Science Journal

Write a paragraph explaining why you and papers organized.

The Periodic Table and Physical Properties 67

Anticipation Guide/KWL Charts
Think about what you already know before beginning a chapter and identify what you would like to learn from reading.

Science Journal
Write about what you know.



Name _____ Date _____

Lesson 1 Solutions (continued)

Main Idea — Details

Water as a Solvent

I found this information on page _____.

Model *a molecule of water to show its* polarity. *Mark the positive areas with a + and the negative areas with a –. Label the* oxygen atoms, hydrogen atoms, *and* shared electrons.

I found this information on page _____.

Complete *the table to show how water molecules attract* polar molecules *and* ionic compounds.

	Polar Molecule	Ionic Compound
by positive molecule		
ative ule		

nd nonelectrolytes. *Complete the flow*

The substance is _____ and _____ conduct electricity in solution.

in ions in water?

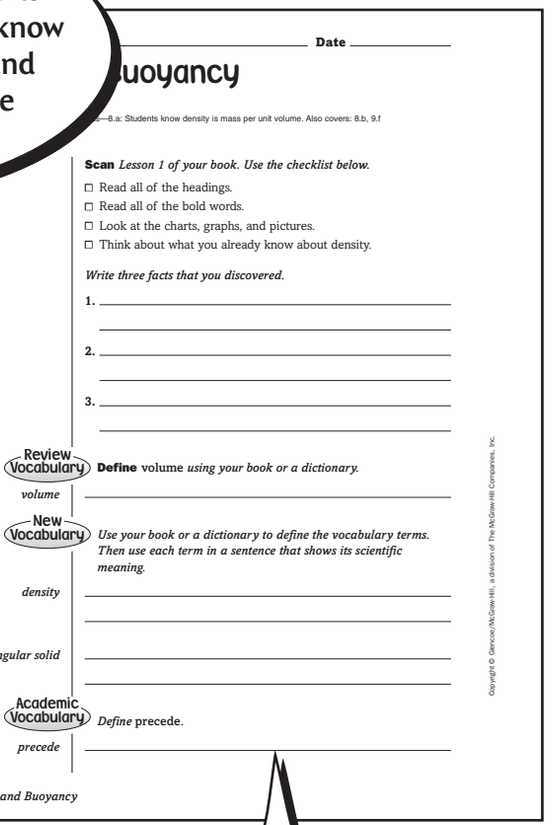
no

The substance is _____ conduct electric

SUMMARIZE IT Summarize three main ideas of the above sections.

Acids and Bases in Solution 95

Summarize It
Each note-taking page ends with an activity that asks you to reflect on your notes and identify key concepts.



Date _____

uoyancy

–8.a: Students know density is mass per unit volume. Also covers: 8.b, 9.f

Scan *Lesson 1 of your book. Use the checklist below.*

- ☐ Read all of the headings.
- ☐ Read all of the bold words.
- ☐ Look at the charts, graphs, and pictures.
- ☐ Think about what you already know about density.

Write three facts that you discovered.

1. _____
2. _____
3. _____

Review Vocabulary **Define** volume *using your book or a dictionary.*

volume _____

New Vocabulary *Use your book or a dictionary to define the vocabulary terms. Then use each term in a sentence that shows its scientific meaning.*

density _____

ngular solid _____

Academic Vocabulary *Define* precede.

precede _____

y and Buoyancy

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Vocabulary Development
Each lesson begins with vocabulary words that you will use as you study it. *Academic Vocabulary* helps you to score higher on standardized tests.

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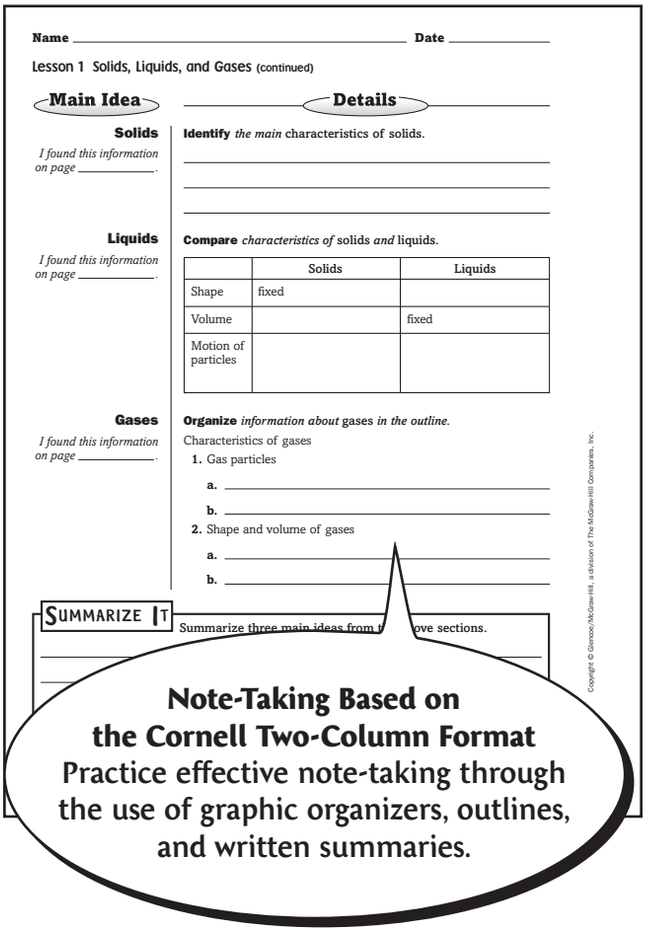

Name _____ Date _____

Lesson 1 Solids, Liquids, and Gases (continued)

Main Idea — **Details**

Solids

I found this information on page _____.

Identify *the main* characteristics of solids.

_____

_____

_____

Liquids

I found this information on page _____.

Compare *characteristics of* solids *and* liquids.

	Solids	Liquids
Shape	fixed	
Volume		fixed
Motion of particles		

Gases

I found this information on page _____.

Organize *information about* gases *in the outline.*

Characteristics of gases

1. Gas particles
   - a. _____
   - b. _____
2. Shape and volume of gases
   - a. _____
   - b. _____

SUMMARIZE IT

Summarize three main ideas from t ove sections.

_____

_____

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Note-Taking Based on the Cornell Two-Column Format

Practice effective note-taking through the use of graphic organizers, outlines, and written summaries.

Chapter Wrap-Up

This brings the information together for you. Revisiting what you thought at the beginning of the chapter provides another opportunity for you to discuss what you have learned.

Name _____ Date _____

The Periodic Table and Physical Properties Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third .

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Fo ble.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words
- ☐ Review daily homework assignme
- ☐ Re-read the chapter and revi
- ☐ Review the Standards Ch
- ☐ Look over the Standards

SUMMARIZE IT Afte

sentences for each lesson to i

_____

_____

_____

_____

_____

The Periodic Table

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Review Checklist

This list helps you assess what you have learned and prepare for your chapter tests.

Name _____ Date _____

Lesson 1 Chemical Properties and Changes (continued)

Main Idea — **Details**

I found this information on page _____.

Identify *six examples of* physical properties of matter.

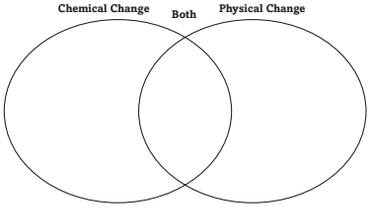
Examples of Physical Properties of Matter	
1.	4.
2.	5.
3.	6.

Chemical and Physical Changes

I found this information on page _____.

Compare and contrast chemical changes *and* physical changes *by completing the Venn diagram, using the phrases listed.*

- properties of substance change
- can often be reversed
- not easily reversed
- forms new substance
- identity of substance does not change
- dissolving is an example
- burning is an example
- includes changes of state



SUMMARIZE IT

Summarize three main ideas of the above sections.

_____

_____

_____

_____

82 *Chemical Reactions*

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Graphic Organizers

A variety of visual organizers help you to analyze and summarize information and remember content.

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Name _____ **Date** _____

Motion

Grade 8 Science Content Standards—1.c: Students know how to solve problems involving distance, time, and average speed. Also covers: 1.a, 1.b, 1.d, 1.e, 1.f, 9.d, 9.e

Before You Read

Before you read the chapter, think about what you know about the topic. List three things that you already know about motion in the first column. Then list three things that you would like to learn about motion in the second column.

K What I know	W What I want to find out

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Write a short description of how the motion of the racers might change from the start of the race to the finish line.

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Name _____ **Date** _____

Motion

Lesson 1 Determining Position

Grade 8 Science Content Standards—1.a: Students know position is defined in relation to some choice of a standard reference point and a set of reference directions.

Scan *Lesson 1 of your book. Use the checklist below.*

- ☐ Read all of the headings.
- ☐ Read all of the bold words.
- ☐ Look at the charts, graphs, and pictures.
- ☐ Think about what you already know about determining position.

Write three things that you learn about determining position.

1. _____

2. _____

3. _____

Review Vocabulary

Define distance.

distance _____

New Vocabulary

Write a paragraph, using all of the vocabulary terms.

reference point _____

displacement _____

vector _____

Academic Vocabulary

Use a dictionary to define dimension. *Then use it in a sentence to show its scientific meaning.*

dimension _____

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Name _____ **Date** _____

Lesson 1 Determining Position (continued)

Main Idea	Details
Position and reference point *I found this information on page _____.*	**Identify** *three pieces of information needed to describe an object's* position. **1.** _____ **2.** _____ **3.** _____
I found this information on page _____.	**Summarize** *how* + and – signs *are used to show direction.* _____ _____
I found this information on page _____.	**Organize** *information about* vectors. *Complete the diagram.* **A vector is described by**
Position in Two Dimensions *I found this information on page _____.*	**Analyze** *why a map uses two reference directions to describe position.* _____ _____ _____

SUMMARIZE IT

Summarize the main ideas of the above sections in three bullet points.

_____

_____

_____

_____

_____

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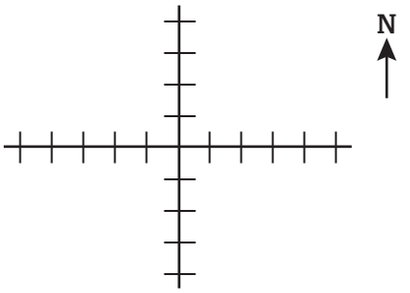
Name _____ **Date** _____

Lesson 1 Determining Position (continued)

Main Idea	Details
Position in Two Dimensions *I found this information on page _____.*	**Model** *how to* locate a position *using two reference directions. Label the* x-axis, y-axis, *and* origin. *Then put a dot at the position that is 20 m east and 10 m north of the origin. Each mark on the axes represents 10 m.* 
Changing Position *I found this information on page _____.*	**Contrast** distance *and* displacement. *Draw a diagram to show distance and displacement for a person moving halfway around a park. Label the distance and displacement.*

SUMMARIZE IT Summarize three main ideas of the above sections in three bullet points.

_____

_____

_____

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Name _____ **Date** _____

Motion

Lesson 2 Speed, Velocity, and Acceleration

Grade 8 Science Content Standards—1.c: Students know how to solve problems involving distance, time, and average speed. Also covers: 1.b, 1.d, 1.e

Skim *the headings in Lesson 2 of your book. Identify four topics that will be discussed.*

1. _____
2. _____
3. _____
4. _____

Review Vocabulary

Define rate *using your book or a dictionary.*

rate _____

New Vocabulary

Use your book or a dictionary to define the vocabulary terms.

speed _____

constant speed _____

instantaneous speed _____

average speed _____

velocity _____

acceleration _____

Academic Vocabulary

Define constant, *using a dictionary.*

constant _____

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Name _____ **Date** _____

Lesson 2 Speed, Velocity, and Acceleration (continued)

Main Idea	Details
What is speed? *I found this information on page _____.*	**Create** *a graphic organizer to contrast* constant speed *and* changing speed. *Include at least four facts.*
What is average speed? *I found this information on page _____.*	**Summarize** *how to* calculate average speed. *Complete the formula with words. Then write it in symbols, and identify the unit used to measure speed.* average speed = $\frac{\square}{\square}$ $\quad$ $\_\_\_\_ = \frac{\square}{\square}$ Unit: _____
I found this information on page _____.	**Analyze** *how to use the equation for average speed to find distance and time. Write the equation you could solve to find each.* Distance: _____ = _____ $\quad$ Time: _____ = $\frac{\square}{\square}$

SUMMARIZE IT

Summarize two main ideas of the above sections.

_____

_____

_____

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Name _____ **Date** _____

Lesson 2 Speed, Velocity, and Acceleration (continued)

Main Idea

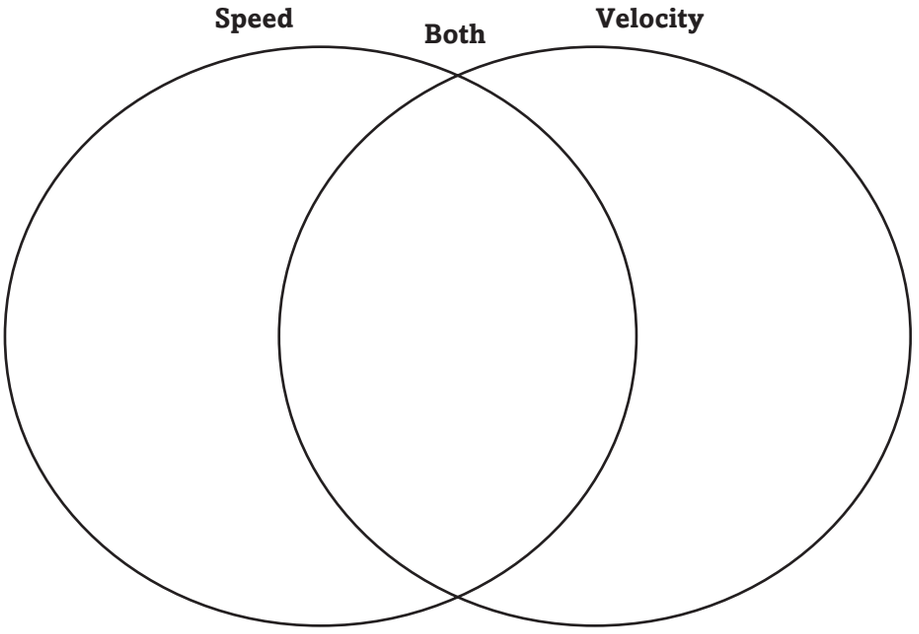
Details

Velocity

I found this information on page _____.

Compare and contrast speed *and* velocity *by using the phrases listed to fill in the Venn diagram.*

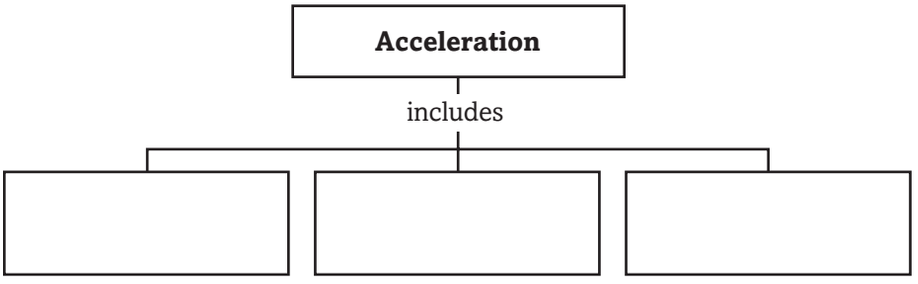
- describes a rate
- includes direction
- is a vector
- describes how fast an object moves
- includes distance
- includes time
- is not a vector



Acceleration

I found this information on page _____.

Distinguish *three ways that an object can accelerate. Complete the concept map.*



Summarize It

Summarize the main ideas of the above sections in two bullet points.

_____

_____

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Name _____ **Date** _____

Motion

Lesson 3 Graphing Motion

Grade 8 Science Content Standards—1.f: Students know how to interpret graphs of position versus time and graphs of speed versus time for motion in a single direction. Also covers: 9.d, 9.e

Skim *Lesson 3 of your book. Write three questions that come to mind. Look for answers to your questions as you read the lesson.*

1. _____

2. _____

3. _____

Review Vocabulary

Define linear.

linear _____

New Vocabulary

Use your book or a dictionary to define each term. Then use the term in a sentence that shows its scientific meaning.

slope _____

_____

rise _____

_____

_____

run _____

_____

Academic Vocabulary

Use a dictionary to define similar. *Then use it in a sentence to show its scientific meaning.*

similar _____

_____

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Name _____ **Date** _____

Lesson 3 Graphing Motion (continued)

Main Idea

Details

Position-Time Graphs

I found this information on page _____.

Create *a position-time graph. Use the data in the table in your book to sketch and label a graph.*

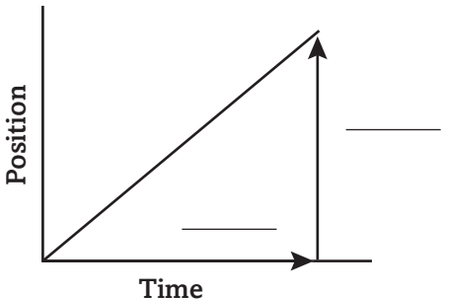
I found this information on page _____.

Complete *the sentence to show how* **speed is related to the slope of a position-time graph.**

The _____ the slope of a position-time graph, the _____ the speed.

I found this information on page _____.

Model *how to calculate the* **slope of a position-time graph.** *Label the* **rise** *and* **run** *on the graph below. Then write the* **equation for determining slope.**



Slope = $\frac{\square}{\square}$

Summarize It

Summarize two main ideas of the above section.

_____

_____

_____

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Name _____ **Date** _____

Lesson 3 Graphing Motion (continued)

Main Idea

Details

Position-Time Graphs

I found this information on page _____.

Summarize *the relationship between* average speed *and the* slope of a position-time graph. *Then explain how to find the average speed of an object with changing speed.*

_____

_____

_____

_____

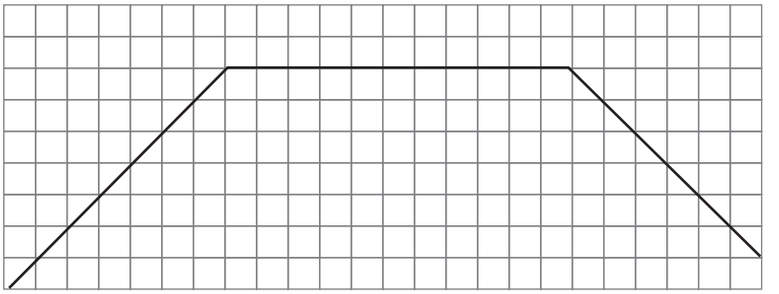
Speed-Time Graphs

I found this information on page _____.

Analyze *the speed-time graph below. Label the axes and parts of the graph with the labels listed.*

- Speed (m/s)
- Time (s)
- constant speed
- decreasing speed
- increasing speed

Speed v. Time



I found this information on page _____.

Distinguish *between the lines for* constant, increasing, *and* decreasing speed *on a speed-time graph.*

A line for constant speed _____.

A line for increasing speed _____.

A line for decreasing speed _____.

Summarize It

Summarize the main ideas of the above sections in two bullet points.

_____

_____

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Name _____ **Date** _____

Lesson 3 Graphing Motion (continued)

Main Idea

Comparing Position-Time and Speed-Time Graphs

I found this information on page _____.

Details

Create *drawings in the boxes provided to contrast the four types of motion described.*

Type of Motion	Position-Time Graph	Speed-Time Graph
Object at rest		
Object moving at constant speed		
Object speeding up		
Object slowing down		

Summarize It

Summarize two main ideas of the above section.

_____

_____

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Name _____ **Date** _____

Motion Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column.

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After studying the chapter, write one summary sentence for each lesson to illustrate the chapter's main ideas.**

_____

_____

_____

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Name _____ **Date** _____

Forces

Grade 8 Science Content Standards—2.c: Students know when the forces on an object are balanced, the motion of the object does not change. Also covers: 2.a, 2.b, 2.d, 2.e, 2.f

Before You Read

Before you read the chapter, think about what you know about the topic. List three things that you already know about forces in the first column. Then list three things that you would like to learn about forces in the second column.

K What I know	W What I want to find out

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Describe three examples of pushing or pulling on an object. In each case, how did the object move?

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Name _____ **Date** _____

Forces

Lesson 1 Combining Forces

Grade 8 Science Content Standards—2.b: Students know when an object is subject to two or more forces at once, the result is the cumulative effect of all the forces. Also covers: 2.a, 2.c

Scan *Lesson 1 of your book. Read the headings, and look at the illustrations. Predict three things that will be discussed.*

1. _____

2. _____

3. _____

Review Vocabulary

Define vector *using your book or a dictionary.*

vector _____

New Vocabulary

Read the definitions below. Write the correct vocabulary term on the blank to the left of each definition.

_____ force that is exerted only when two objects are touching

_____ idea stating that when the net force acting on an object is zero, an object at rest remains at rest, and that when the object is moving, it continues to move in a straight line with constant speed

_____ push or pull

_____ combination of all of the forces acting on an object

_____ state in which the net force acting on an object is not zero

_____ state in which the net forces acting on an object are zero

_____ force that one object exerts on another when the objects are not touching

Academic Vocabulary

Use a dictionary to define **specify**. *Then use it in a sentence to show its scientific meaning.*

specify _____

_____

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Name _____ **Date** _____

Lesson 1 Combining Forces (continued)

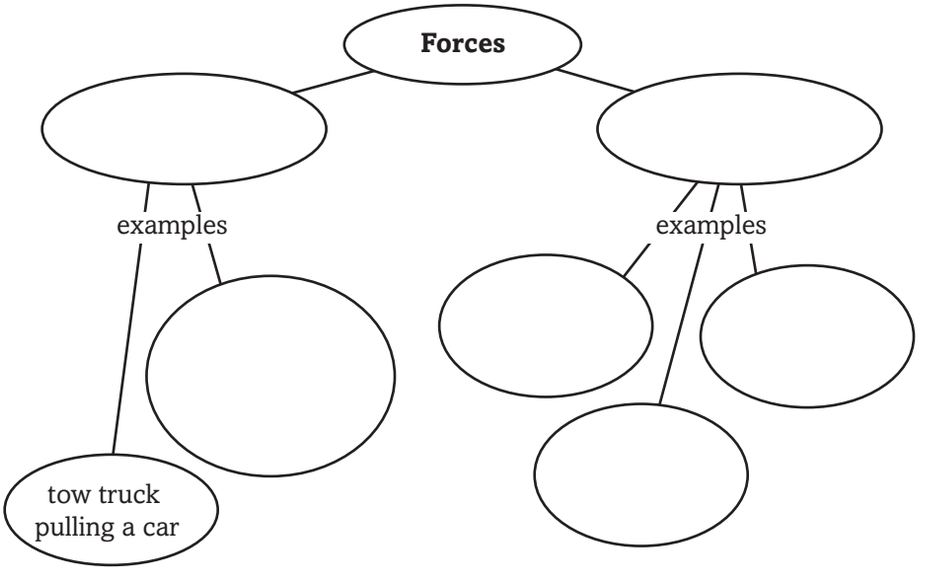
Main Idea

Details

What is a force?

I found this information on page _____.

Organize *information about* contact forces *and* noncontact forces *by completing the diagram.*



Combining Forces

I found this information on page _____.

Model *force vector arrows to show the* net forces *that result when each pair of forces is combined. Label the* magnitude *of each net force.*

Forces Acting in Same Direction

Net Force:

Forces Acting in Opposite Directions

Net Force:

Summarize It

Summarize three main ideas of the above sections.

_____

_____

_____

_____

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Name _____ **Date** _____

Lesson 1 Combining Forces (continued)

Main Idea

Details

How do forces affect motion?

I found this information on page _____.

Create *two drawings to show how an object is affected by* balanced *and* unbalanced *forces moving in opposite directions. Use arrows and labels to show the forces and motions. Below each drawing, explain the effect of the forces.*

Balanced Forces	Unbalanced Forces

Newton's First Law of Motion

I found this information on page _____.

Rephrase Newton's first law of motion *in your own words.*

_____

_____

Define inertia.

Inertia is _____.

Summarize It

Summarize the main ideas of the above sections with two bullet points.

_____

_____

_____

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Name _____ **Date** _____

Forces

Lesson 2 Types of Forces

Grade 8 Science Content Standards—2.d: Students know how to identify separately the two or more forces that are acting on a single static object, including gravity, elastic forces due to tension or compression in matter, and friction.

Scan *the* What You'll Learn *statements for Lesson 2 of your book. Identify three topics that will be discussed.*

1. _____
2. _____
3. _____

Review Vocabulary **Define** velocity, *using your book or a dictionary.*

velocity _____

New Vocabulary *Use your book to define the following terms.*

gravity _____

weight _____

friction _____

elastic force _____

tension force _____

compression force _____

normal force _____

Academic Vocabulary *Use a dictionary to define* involve.

involve _____

_____

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Lesson 2 Types of Forces (continued)

Main Idea

What is gravity?

I found this information on page _____.

Details

Rephrase *the* law of universal gravitation.

_____

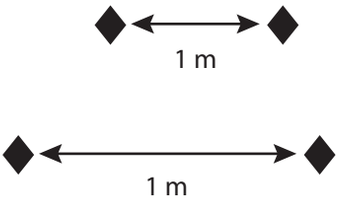
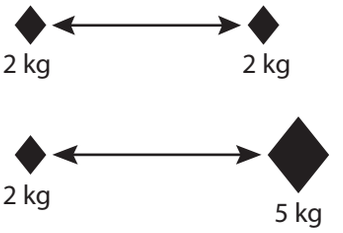
_____

_____

_____

I found this information on page _____.

Label *the diagrams to indicate how a* change in distance or mass affects the gravitational attraction *between objects.*

	
As distance increases, gravitational attraction _____.	As mass increases, gravitational attraction _____.

Summarize It

Summarize the main ideas of the above sections with two bullet points.

_____

_____

_____

_____

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Lesson 2 Types of Forces (continued)

Main Idea

Details

Friction

I found this information on page _____.

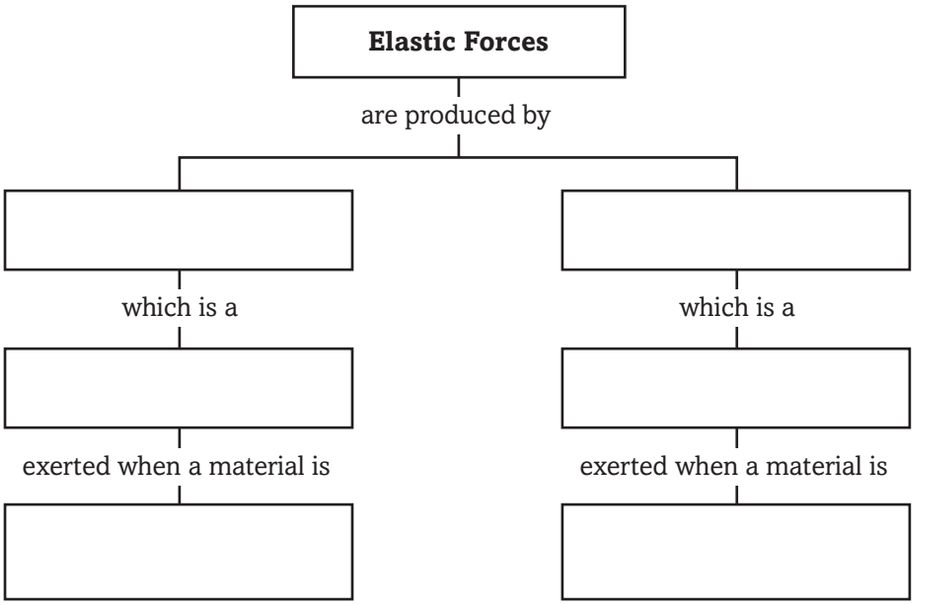
Organize *information about* friction *by completing the table.*

Type of Friction	Definition	Example
Static		
Sliding		

Elastic Forces

I found this information on page _____.

Distinguish *between the two types of forces that produce* elastic forces *by completing the graphic organizer.*



Summarize It

Summarize two main ideas of the above sections.

_____

_____

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Lesson 2 Types of Forces (continued)

Main Idea

Details

Elastic Forces

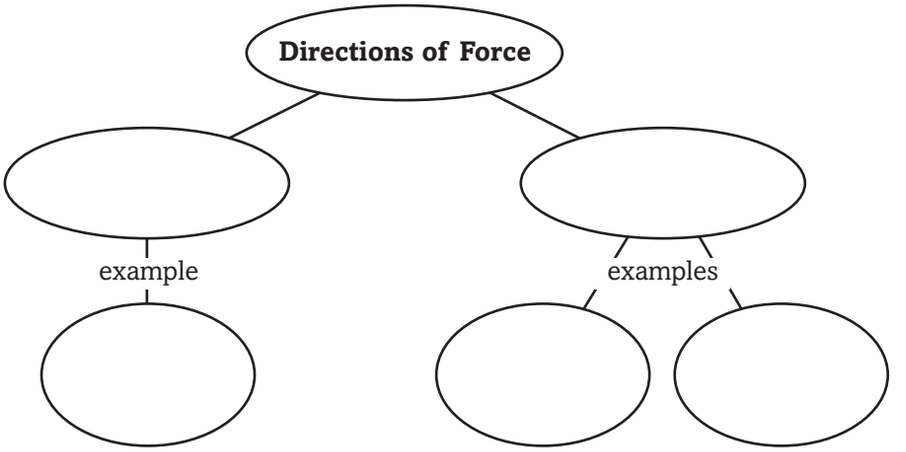
I found this information on page _____.

Create *a drawing showing the forces acting on a cup resting on a table. Use arrows to show the directions in which the forces act. Label each arrow with the force it represents.*

Identifying Forces on an Object

I found this information on page _____.

For a book sliding on a table, **classify** *forces that act in the* horizontal direction *and forces that act in the* vertical direction *by completing the graphic organizer.*



Summarize It

Summarize two main ideas of the above sections.

_____

_____

_____

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Forces

Lesson 3 Unbalanced Forces and Acceleration

Grade 8 Science Content Standards—2.e: Students know that when the forces on an object are unbalanced, the object will change its velocity (this is, it will speed up, slow down, or change direction). Also covers: 2.f

Scan *Lesson 3 of your book. Use the checklist below.*

- ☐ Read all of the headings.
- ☐ Read all of the bold words.
- ☐ Look at the pictures and tables.
- ☐ Think about what you already know about unbalanced forces and acceleration.

Write two things that you will learn about unbalanced forces and acceleration.

1. _____

2. _____

Review Vocabulary

Define acceleration, *using your book or a dictionary.*

acceleration _____

New Vocabulary

Use your book or a dictionary to define the vocabulary terms.

centripetal force _____

_____

Newton's second law of motion _____

_____

Newton's third law of motion _____

_____

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Name _____ **Date** _____

Lesson 3 Unbalanced Forces and Acceleration (continued)

Main Idea

Details

Unbalanced Forces and Velocity

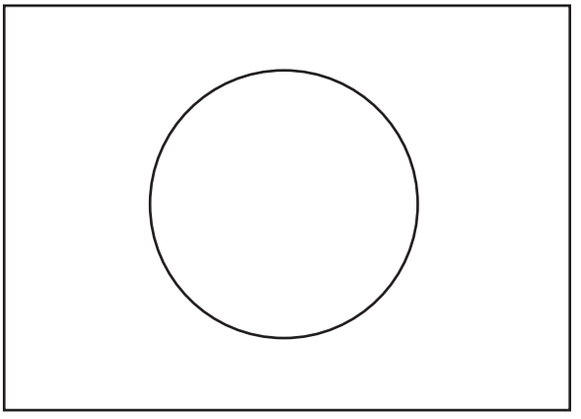
I found this information on page _____.

Analyze *how* unbalanced forces change *the* velocity *and* acceleration *of objects by completing the cause-and-effect graphic organizers below.*

Cause	Effect
unbalanced force exerted on object at rest	
unbalanced force applied in the same direction an object is moving	
	object slows down

I found this information on page _____.

Create *a top view of an object moving in a circle at constant speed, such as a ball on a string. Show at least two positions of the object. At each position, draw an arrow for the object's velocity and another arrow for the centripetal force of the object.*



Summarize It

Summarize a main idea of the above section.

_____

_____

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Name _____ **Date** _____

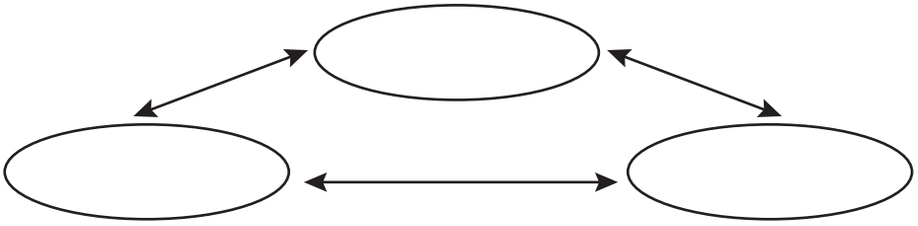
Lesson 3 Unbalanced Forces and Acceleration (continued)

Main Idea	Details

Newton's Second Law of Motion

I found this information on page _____.

Complete *the concept map with properties of an object that are related by Newton's second law of motion.*



I found this information on page _____.

Define *how to* **calculate average acceleration using Newton's second law of motion.** ***Complete the formula and the chart below.***

acceleration = _____

$$= \frac{F}{\quad}$$

Calculating Acceleration		
Symbol	Stands for	Measured in
a		
	net force	newtons; N
		kilograms; kg

Newton's Third Law of Motion

I found this information on page _____.

Identify *the two forces involved in a force pair.*

_____

_____

SUMMARIZE IT

Summarize a main idea from the above section.

_____

_____

_____

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Name _____ **Date** _____

Forces Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column.

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the tables and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After studying the chapter, write one summary sentence for each lesson to illustrate the chapter's main ideas.**

_____

_____

_____

_____

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Name _____ Date _____

Density and Buoyancy

Grade 8 Science Content Standards—8.a: Students know density is mass per unit volume. Also covers: 8.b, 8.c, 8.d, 9.f

Before You Read

Before you read the chapter, think about what you know about the topic. List three things that you already know about density and buoyancy in the first column. Then list three things that you would like to learn about them in the second column.

K What I know	W What I want to find out

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Compare and contrast three objects that float with three objects that sink.

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Name _____ **Date** _____

Density and Buoyancy

Lesson 1 Density

Grade 8 Science Content Standards—8.a: Students know density is mass per unit volume. Also covers: 8.b, 9.f

Scan *Lesson 1 of your book. Use the checklist below.*

- ☐ Read all of the headings.
- ☐ Read all of the bold words.
- ☐ Look at the tables and pictures.
- ☐ Think about what you already know about density.

Write three facts that you discovered.

1. _____

_____

2. _____

_____

3. _____

_____

Review Vocabulary

Define volume *using your book or a dictionary.*

volume _____

New Vocabulary

Use your book or a dictionary to define the vocabulary terms. Then use each term in a sentence that shows its scientific meaning.

density _____

_____

rectangular solid _____

_____

Academic Vocabulary

Define preceding.

preceding _____

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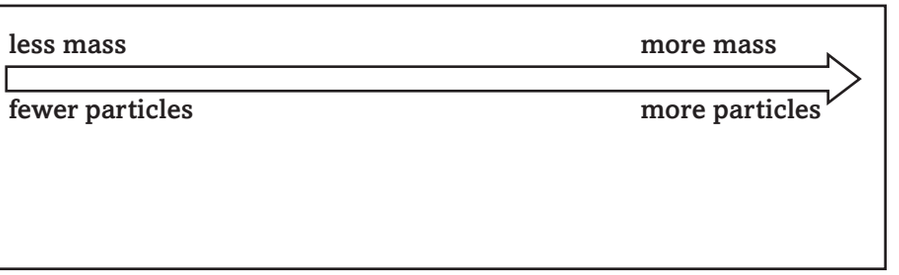
Name _____ **Date** _____

Lesson 1 Density (continued)

Main Idea	Details
What is density? *I found this information on page _____.*	**Draw** *and label an arrow to show how* density *changes as the* mass *and* number of particles *in an equal volume change.* 
I found this information on page _____.	**Complete** *the equation with words to show* how density is calculated. *Give the unit for each part of the equation. Then write the equation with symbols.* density (_____) = _____ divided by _____ Equation: _____
I found this information on page _____.	**Summarize** *the two properties that change when a material is broken into smaller pieces and the one that does not.* The _____ and _____ of the material change, but its _____ does not change.
I found this information on page _____.	**Analyze** *the factors that determine the density of a material. Complete the diagram.* The density of a material depends on _____

Summarize It

Summarize the main ideas of the above section in two bullet points.

_____

_____

_____

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Name _____ **Date** _____

Lesson 1 Density (continued)

Main Idea

Details

Measuring Density

I found this information on page _____.

Summarize *the steps used to find* the density of a liquid.

1. _____
2. _____
3. _____

I found this information on page _____.

Complete *the formula below to show how to calculate* the volume of a rectangular solid.

Volume = _____ × _____ × _____

I found this information on page _____.

Sequence *the steps used to find* the volume of an irregular solid. *Draw how the lab equipment might look for each step.*

1. Place water in a graduated cylinder, and record its volume.

↓

2.

↓

3.

Summarize It

Summarize two main ideas of the above section.

_____

_____

_____

_____

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Name _____ **Date** _____

Density and Buoyancy

Lesson 2 Pressure and the Buoyant Force

Grade 8 Science Content Standards—8.c: Students know the buoyant force on an object in a fluid is an upward force equal to the weight of the fluid the object has displaced. Also covers: 9.f

Scan *the headings in Lesson 2 of your book. Predict three topics that will be discussed.*

1. _____
2. _____
3. _____

Review Vocabulary

Define force *using your book or a dictionary.*

force _____

New Vocabulary

Use your book or a dictionary to define the vocabulary terms. Then use each term in a sentence to show its scientific meaning.

fluid _____

_____

pressure _____

_____

atmospheric pressure _____

_____

buoyant force _____

_____

Academic Vocabulary

Use a dictionary to define area *to show its scientific meaning.*

area _____

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Lesson 2 Pressure and the Buoyant Force (continued)

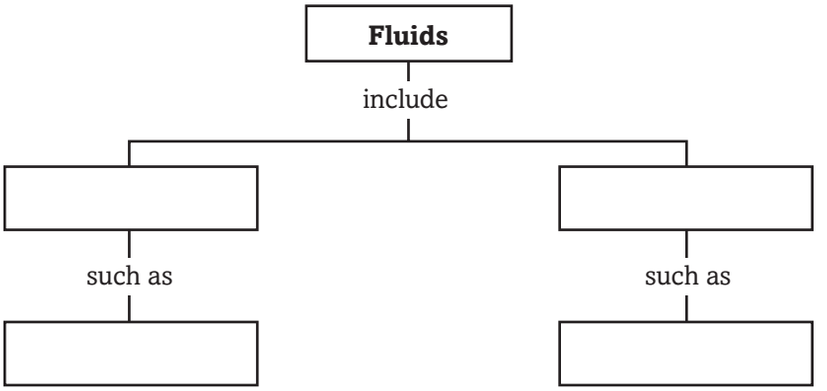
Main Idea

Details

Pressure in a Fluid

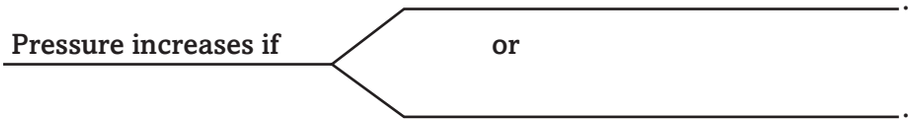
I found this information on page _____.

Classify *the 2 types of* fluids, *and give an example of each.*



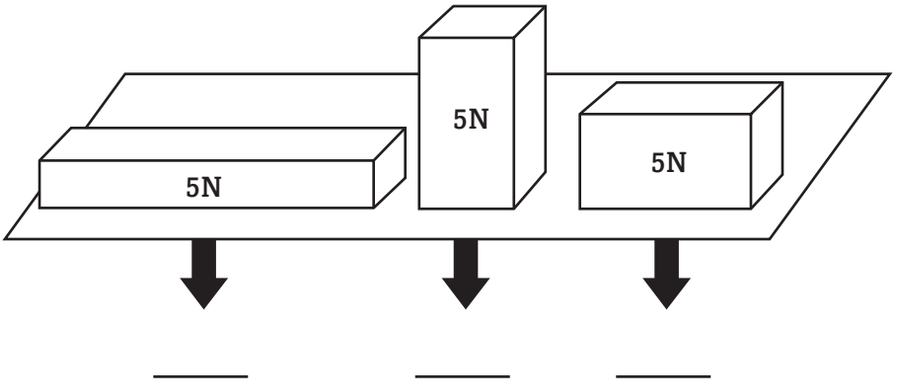
I found this information on page _____.

Summarize *the* effects of force and area on pressure *by completing the diagram.*



I found this information on page _____.

Sequence *the diagrams to show how pressure is related to surface area. Number the diagrams from 1 (least pressure) to 3 (most pressure).*



_____ _____ _____

Summarize It

Rephrase two main ideas of the above section.

_____

_____

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Name _____ **Date** _____

Lesson 2 Pressure and the Buoyant Force (continued)

Main Idea | **Details**

Pressure in a Fluid

I found this information on page _____.

Complete *the equation for* calculating pressure. *Include the units used for each measurement. Then write the equation in symbols.*

Pressure (in _____) = $\frac{\text{_____ (in _____)}}{\text{_____ (in meters squared)}}$

I found this information on page _____.

Analyze *how the pressure exerted by a fluid changes with height and depth.*

As the height of a column of fluid increases, _____

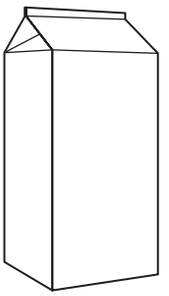
_____.

As the depth below the surface of a fluid increases, _____

_____.

I found this information on page _____.

Model *the effect of pressure on a fluid at different levels. Indicate the force with which milk would squirt out of holes punched in the side of the milk carton.*



I found this information on page _____.

Summarize *how* atmospheric pressure *changes as* elevation *changes.*

Higher elevation → _____ atmospheric pressure

SUMMARIZE IT

Summarize three main ideas of the above section.

_____

_____

_____

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Name _____ **Date** _____

Lesson 2 Pressure and the Buoyant Force (continued)

Main Idea

Details

What causes the buoyant force?

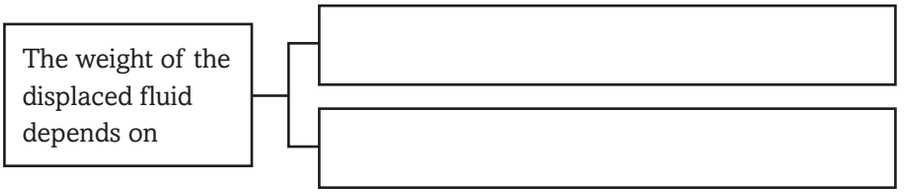
I found this information on page _____.

Model *the* buoyant force *on an object. Draw a fish under water. Use arrows to show the forces acting on the fish. Then write a sentence explaining why the* net force *is upward.*

I found this information on page _____.

Rephrase Archimedes' principle *in your own words.*

Complete *the diagram to show what determines the weight of the fluid displaced by an object.*



Summarize It

Choose two main ideas from this section.

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Name _____ **Date** _____

Density and Buoyancy

Lesson 3 Sinking and Floating

Grade 8 Science Content Standards—8.d: Students know how to predict whether an object will float or sink.

Skim *Lesson 3 of your book. Write three questions that come to mind. Look for answers to your questions as you read the lesson.*

1. _____
2. _____
3. _____

Review Vocabulary

Define gravity *using your book or a dictionary, then write a sentence to show its scientific meaning.*

gravity _____

New Vocabulary

Use your book or a dictionary to define the vocabulary term. Then use the term in a sentence that shows its scientific meaning.

hydrometer _____

Academic Vocabulary

Use your book or a dictionary to define ratio, *then use it in a sentence to show its scientific meaning.*

ratio _____

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Name _____ **Date** _____

Lesson 3 Sinking and Floating (continued)

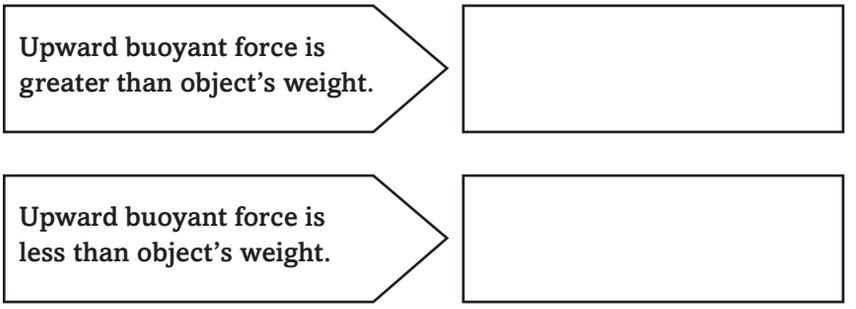
Main Idea

Details

Why do objects sink or float?

I found this information on page _____.

Analyze *what causes an object to* sink *or* float. *Complete the cause-and-effect diagrams.*



The Buoyant Force and Density

I found this information on page _____.

Organize *information about the relationship between the* density of an object *and* its ability to sink or float *by completing the table.*

If the density of an object is . . .	Then it will . . .
Less than the density of a fluid	
Greater than the density of a fluid	

I found this information on page _____.

Summarize *the reason that a metal boat floats even though the metal's density is greater than that of water.*

_____

_____

_____

Identify *the* function of a hydrometer.

A hydrometer is used to _____.

Summarize It

Summarize two main ideas of the above sections.

_____

_____

_____

_____

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Name _____ **Date** _____

Lesson 3 Sinking and Floating (continued)

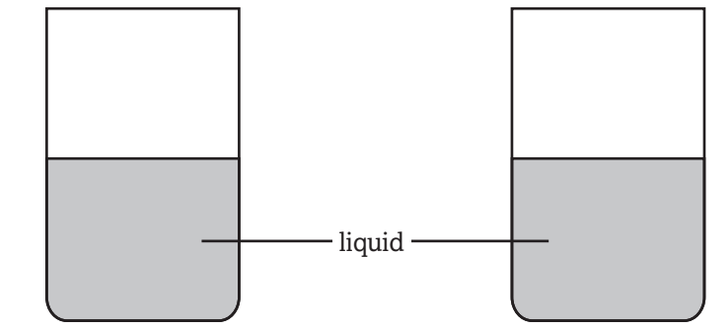
Main Idea

Details

The Buoyant Force and Density

I found this information on page _____.

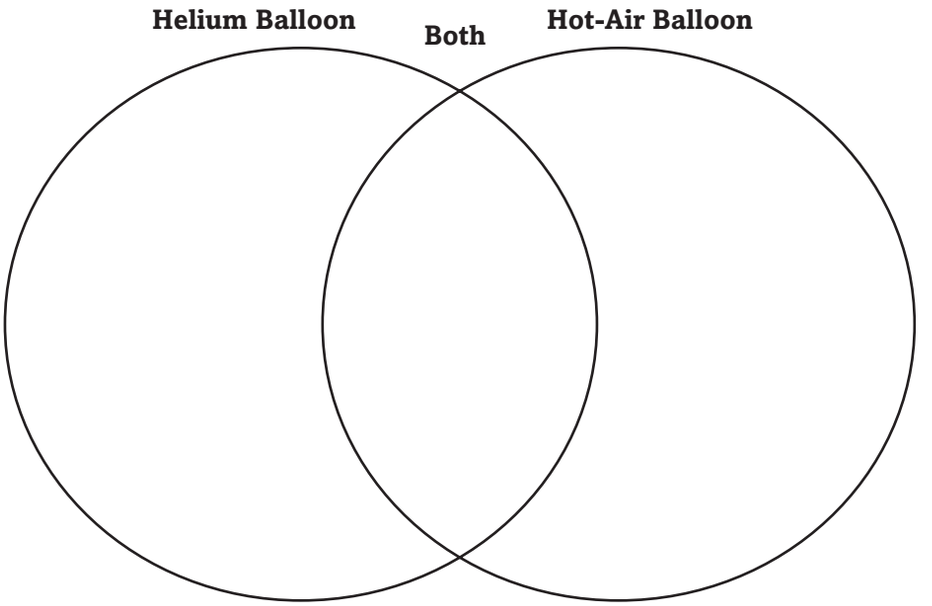
Model *how a hydrometer floats in* a liquid more dense than water *and in* a liquid less dense than water. *Draw the hydrometer's position in each diagram.*



Floating and Sinking in the Atmosphere

I found this information on page _____.

Compare and contrast *helium and hot-air balloons. Complete the Venn diagram with at least five facts.*



Summarize It

Rephrase the main ideas of the above sections.

_____

_____

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Name _____ **Date** _____

Density and Buoyancy Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column.

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

Summarize It

After studying the chapter, write one summary sentence for each lesson to illustrate the chapter's main ideas.

_____

_____

_____

_____

_____

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Name _____ Date _____

Understanding the Atom

Grade 8 Science Content Standards—3.a: Students know the structure of the atom and know it is composed of protons, neutrons, and electrons. Also covers: 3.f, 7.b

Before You Read

Before you read the chapter, think about what you know about the topic. List three things that you already know about atoms in the first column. Then list three things that you would like to learn about atoms in the second column.

K What I know	W What I want to find out

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Write a paragraph on what you know about the atom.

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Name _____ **Date** _____

Understanding the Atom

Lesson 1 Atoms—Basic Units of Matter

Grade 8 Science Content Standards—3.a: Students know the structure of the atom and know it is composed of protons, neutrons, and electrons.

Scan *the* What You'll Learn *statements for Lesson 1. List three topics that will be discussed.*

1. _____
2. _____
3. _____

Review Vocabulary

Define mass *using your book or a dictionary.*

mass _____

New Vocabulary

Write a paragraph using all of the vocabulary terms to show their meanings.

matter _____

atom _____

nucleus _____

proton _____

neutron _____

electron _____

Academic Vocabulary

Use your book or a dictionary to define proportion. *Then use the term in a sentence.*

proportion _____

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Name _____ **Date** _____

Main Idea

What is the current atomic model?

I found this information on page _____.

Details

Conclude *why the* atomic-force microscope *is important to scientists.*

_____

_____

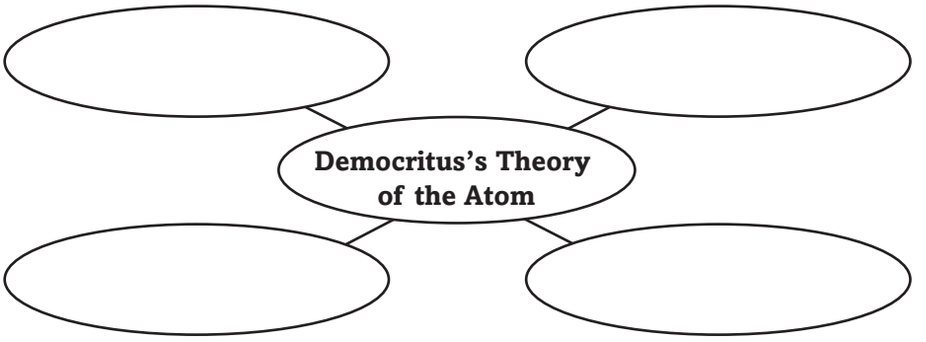
Compare protons, neutrons, *and* electrons.

Particle	Where Found	Charge	Mass (amu)
Proton		+1	
Neutron			1.008701
Electron			

Is there historical evidence of atoms?

I found this information on page _____.

Organize *information about* Democritus's theory of the atom *using the concept map.*



Complete *the statement to summarize* what an atom is.

An atom of aluminum is _____.

Summarize It

Summarize three main ideas from the above sections.

_____

_____

_____

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Name _____ **Date** _____

Lesson 1 Atoms—Basic Units of Matter (continued)

Main Idea

Is there historical evidence of atoms?

I found this information on page _____.

Details

Sequence *the steps of* Antoine Lavoisier's experiments *on mercury (II) oxide. Complete the flow chart.*

Summarize *the* law of conservation of mass *and the* law of definite proportions.

Law of Conservation of Mass: _____

_____

Law of Definite Proportions: _____

_____

Create *a concept map for the* 5 principles of Dalton's atomic model.

I found this information on page _____.

Summarize It

Summarize three main ideas of the above sections.

_____

_____

_____

_____

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Name _____ **Date** _____

Understanding the Atom

Lesson 2 Discovering Parts of the Atom

Grade 8 Science Content Standards—3.a: Students know the structure of the atom and know it is composed of protons, neutrons, and electrons.

Skim *Lesson 2 of your book. Write three questions that come to mind. Look for answers to your questions as you read the lesson.*

1. _____
2. _____
3. _____

Review Vocabulary

Define electromagnetic spectrum *using your book or a dictionary.*

electromagnetic spectrum _____

_____

New Vocabulary

Use your book or a dictionary to define each term. Then use each term in a sentence that shows its scientific meaning.

spectral line _____

_____

_____

energy level _____

_____

_____

electron cloud _____

_____

_____

Academic Vocabulary

Use a dictionary to define research.

research _____

_____

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Name _____ **Date** _____

Lesson 2 Discovering Parts of the Atom (continued)

Main Idea

Details

How were electrons discovered?

I found this information on page _____.

Model *Thomson's* cathode-ray tube experiment. *Draw a diagram showing the experiment.*

Summarize *three conclusions Thomson drew from his experiments.*

1. _____

2. _____

3. _____

Rutherford—Discovering the Nucleus

I found this information on page _____.

Contrast *the* predicted *and* actual *outcomes of Rutherford's students'* gold-foil experiment.

Predicted Outcome	Actual Outcome

SUMMARIZE IT

Summarize two main ideas from the above sections.

_____

_____

_____

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Name _____ **Date** _____

Lesson 2 Discovering Parts of the Atom (continued)

Main Idea

Details

Rutherford—Discovering the Nucleus

I found this information on page _____.

Create *a drawing showing* Rutherford's model of the atom. *Label the* nucleus *and* electrons.

Bohr and the Hydrogen Atom

I found this information on page _____.

Contrast *the* Bohr model *and the* Rutherford model *of how electrons move in an atom.*

_____

_____

_____

Analyze *how* spectral lines *are related to* energy levels. *Complete the statements.*

I found this information

When an electron falls from a higher energy level to a lower one, it _____ energy. This produces _____.

Summarize It

Summarize two main ideas from the above sections.

_____

_____

_____

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Name _____ **Date** _____

Lesson 2 Discovering Parts of the Atom (continued)

Main Idea	Details
Bohr and the Hydrogen Atom *I found this information on page* _____.	**Model** *the* Bohr atom. *Draw an atom including 2* energy levels. *Show how many electrons can fit in each energy level.*
I found this information on page _____.	**Analyze** *the strengths and weaknesses of the* Bohr model of the atom. The Bohr model explained _____ _____. It did not explain _____ _____.
The Electron Cloud *I found this information on page* _____.	**Contrast** *the* electron cloud model *with the* Bohr model *of the atom.* _____ _____ _____

Summarize It

Summarize the main ideas of the above sections of this lesson with three bullet points.

_____

_____

_____

_____

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Name _____ **Date** _____

Understanding the Atom

Lesson 3 Elements, Isotopes, and Ions—How Atoms Differ

Grade 8 Science Content Standards—3.f: Students know how to use the periodic table to indentify elements in simple compounds. Also covers: 7.b

Scan *Lesson 3 of your book. Read the headings and look at the illustrations. Predict three topics that will be discussed.*

1. _____

2. _____

3. _____

Review Vocabulary

periodic table

Define periodic table *using your book or a dictionary.*

_____

_____

New Vocabulary

Read the definitions below. Write the correct vocabulary term on the blank to the left of each definition.

_____ total mass of an atom

_____ pure substance made from atoms that all have the same number of protons

_____ number of protons in an atom of an element

_____ atom that has gained or lost electrons and is no longer neutral

_____ sum of the number of protons and neutrons that an atom has

_____ atoms of the same element that have different numbers of neutrons

Academic Vocabulary

contrast

Use your book or a dictionary to define **contrast**.

_____

_____

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Name _____ **Date** _____

Lesson 3 Elements, Isotopes, and Ions—How Atoms Differ (continued)

Main Idea

Details

Different Elements—Different Numbers of Protons

I found this information on page _____.

Sequence *the elements* gold, copper, *and* sulfur *in order by the number of protons in their nuclei. Write the* atomic number *for each element.*

1. Element: _____ Atomic number: _____
2. Element: _____ Atomic number: _____
3. Element: _____ Atomic number: _____

Atomic Number and the Periodic Table

I found this information on page _____.

Model *the periodic table. Shade the* metals, nonmetals, *and* metalloids. *Then draw and label an arrow to show how* atomic number *changes as you move across a row of the table.*

Periodic Table of Elements

	1												13	14	15	16	17	18
1	1 H	2																2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg	3	4	5	6	7	8	9	10	11	12	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	57 La*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	89 Ac~	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Uuu	112 Uub		114 Uuq		116 Uuh		118 Uuo

58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Isotopes—Different Numbers of Neutrons

I found this information on page _____.

Create *a drawing showing two* isotopes *of neon with* mass numbers *of 20 and 22. Neon has an* atomic number *of 10.*

Summarize It

Summarize two main ideas from the above sections.

_____

_____

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Name _____ **Date** _____

Lesson 3 Elements, Isotopes, and Ions—How Atoms Differ (continued)

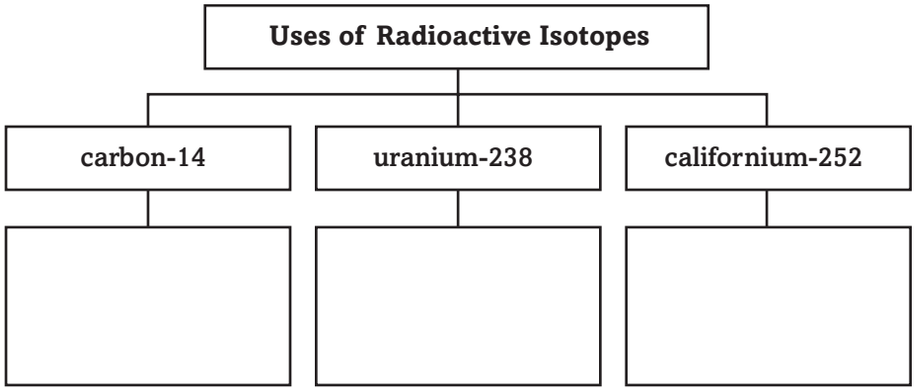
Main Idea

Details

Isotopes—Different Numbers of Neutrons

I found this information on page _____.

Summarize *uses of some* radioactive isotopes *in the concept map.*



I found this information on page _____.

Organize *information about the 3 main isotopes of hydrogen. List the* mass number *and* number of neutrons *for each. Put a check mark by the radioactive isotope.*

Protium: _____

Deuterium: _____

Tritium: _____

Ions—Gaining or Losing Electrons

I found this information on page _____.

Contrast positive *and* negative ions. *Draw an example of each. Then complete the rest of the table.*

	Positive Ion	Negative Ion
Sketch		
Formed when		

Summarize It

Summarize the main ideas of the above sections.

_____

_____

_____

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Name _____ **Date** _____

Understanding the Atom

Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column.

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After reading the chapter, write one or two sentences to summarize the main ideas of each section.**

_____

_____

_____

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Name _____ Date _____

Combining Atoms and Molecules

Grade 8 Science Content Standards—3.a: Students know the structure of the atom and know it is composed of protons, neutrons, and electrons. Also covers: 3.b, 3.c, 3.f, 7.c

Before You Read

Before you read the chapter, respond to these statements.

1. Write an **A** if you agree with the statement.
2. Write a **D** if you disagree with the statement.

Before You Read	Combining Atoms and Molecules
	• The properties of a chemical compound are the same as the properties of each element it contains.
	• An atom that receives an electron becomes negatively charged.
	• Elements that are stable cannot form compounds..
	• Most elements are metals.

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Write three questions you have about solids.

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Name _____ **Date** _____

Combining Atoms and Molecules

Lesson 1 How Atoms Form Compounds

Grade 8 Science Content Standards—3.a: Students know the structure of the atom and know it is composed of protons, neutrons, and electrons. Also covers: 3.b, 3.f

Skim *Lesson 1 of your book. Predict four topics that might be discussed.*

1. _____

2. _____

3. _____

4. _____

Review Vocabulary

Define ion *using your book or a dictionary.*

ion _____

New Vocabulary

Use your book to define the following terms.

compound _____

chemical formula _____

molecule _____

chemical bond _____

ionic bond _____

valence _____

covalent bond _____

Academic Vocabulary

Use a dictionary to define symbol. *Then use it in a sentence to show its scientific meaning.*

symbol _____

_____

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Name _____ **Date** _____

Lesson 1 How Atoms Form Compounds (continued)

Main Idea

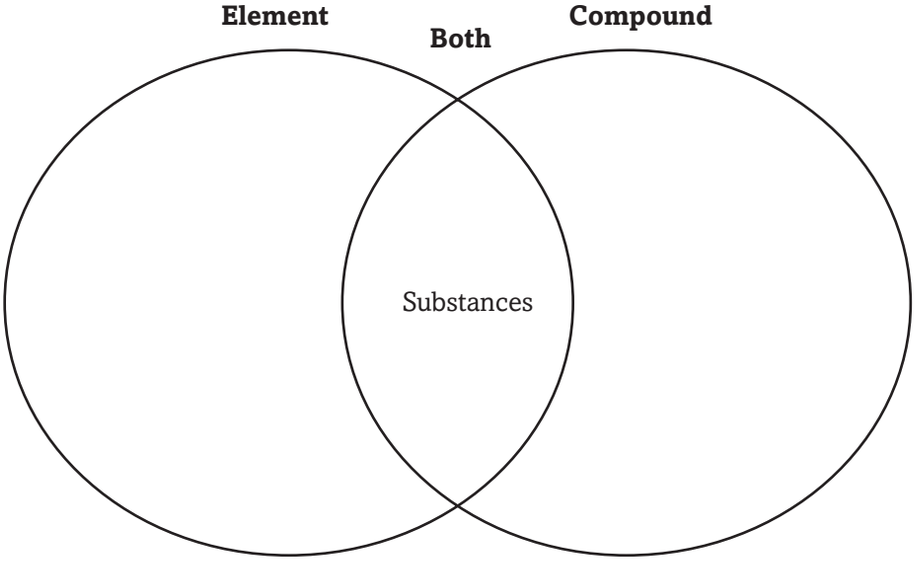
What is a compound?

I found this information on page _____.

Details

Contrast elements *with* compounds *by using the phrases to complete the Venn diagram.*

- made of more than one kind of atom
- about 100 kinds exist
- include water and table sugar
- include gold and carbon
- made of only one kind of atom
- can be described by a chemical formula



I found this information on page _____.

Identify *two things a* chemical formula *tells you about a compound.*

Chemical symbols indicate

_____

_____

_____.

H_2O_2

Subscript numbers indicate

_____

_____

_____.

Summarize It

Summarize two main ideas of the above sections.

_____

_____

_____

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Name _____ **Date** _____

Lesson 1 How Atoms Form Compounds (continued)

Main Idea	Details
What is a compound? *I found this information on page _____.*	**Distinguish** *between the properties of the elements sodium and chlorine and the compound that they form.* sodium + chlorine = sodium chloride _____ _____ _____
Ionic Bonds and Ionic Compounds *I found this information on page _____.*	**Sequence** *the steps in the formation of lithium fluoride.* A lithium atom transfers _____ to a fluorine atom. ↓ The lithium atom becomes a _____, and the fluorine atom becomes a _____. ↓ The two atoms form an _____.
I found this information on page _____.	**Identify** *the 6 properties of ionic* compounds. Properties of Ionic Compounds

SUMMARIZE IT

Summarize the main ideas of the above sections.

_____

_____

_____

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Name _____ **Date** _____

Lesson 1 How Atoms Form Compounds (continued)

Main Idea	Details

Ionic Bonds and Ionic Compounds

I found this information on page _____.

Summarize *what can be learned about an element from its* Lewis dot diagram.

_____

_____

Model ***the arrangement of the valence electrons of different elements by constructing a Lewis dot diagram for each element below.***

Lithium	Beryllium	Boron	Carbon	Nitrogen	Oxygen	Fluorine	Neon

I found this information on page _____.

Define noble gas, ***and explain why noble gases are stable.***

A noble gas is _____

_____.

A noble gas is stable because _____.

Covalent Bonds—Sharing Electrons

I found this information on page _____.

Identify *five properties of* covalent compounds.

1. _____
2. _____
3. _____
4. _____
5. _____

SUMMARIZE IT

Summarize the main ideas of the above sections in three bullet points.

_____

_____

_____

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Name _____ **Date** _____

Main Idea

Details

Covalent Bonds—Sharing Electrons

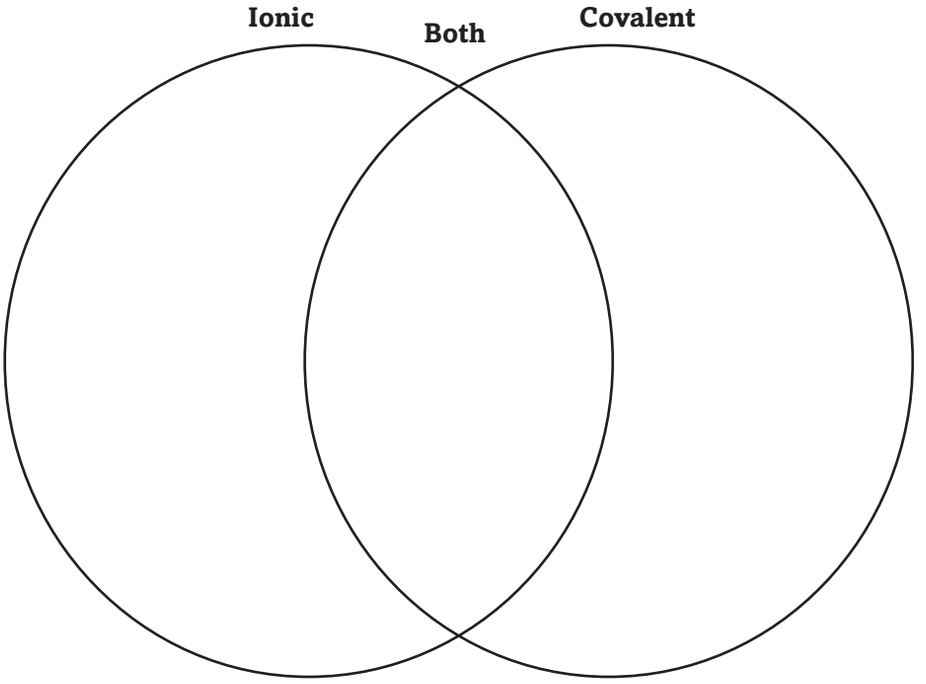
I found this information on page _____.

Organize *information about the* types of covalent bonds *by filling in the table below.*

Type of Covalent Bond	Description	Example
Single		H_2
Double		
Triple		

I found this information on page _____.

Compare and contrast ionic bonds *and* covalent bonds *by completing the Venn diagram below with at least six facts.*



Summarize It

Summarize two main ideas about covalent bonds with two bullet points.

_____

_____

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Name _____ **Date** _____

Combining Atoms and Molecules

Lesson 2 Forming Solids

Grade 8 Science Content Standards—3.c: Students know atoms and molecules form solids by building up repeating patterns, such as the crystal structure of NaCl or long-chain polymers. Also covers: 3.b, 7.c

Scan *Lesson 2 of your book. Predict three topics that might be discussed.*

1. _____
2. _____
3. _____

Review Vocabulary

Define element *using your book or a dictionary.*

element _____

_____

New Vocabulary

Read the definitions below. Write the correct vocabulary term on the blank to the left of each definition.

_____ bond formed when many metal atoms share their pooled electrons

_____ ability of a substance to be pulled into wires

_____ ability of a material to be hammered or rolled into sheets

_____ regular, repeating arrangement of atoms, ions, or molecules

_____ element that is usually shiny, a good conductor of heat and electricity, and a solid at room temperature

_____ covalent compound made up of many small, repeating units linked together in a chain

_____ small molecule that forms a link in a polymer chain

Academic Vocabulary

Use a dictionary to define the verb **alternate**. *Then use it in a sentence.*

alternate _____

_____

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Name _____ **Date** _____

Main Idea

Details

Metals

I found this information on page _____.

Organize *information about* metals *in the table.*

Some Types of Metal	Examples of Uses
Gold	
Copper	
Aluminum	
Steel (iron)	

I found this information on page _____.

Create ***a spider diagram that shows the 5 physical properties of metals.***

Crystals

I found this information on page _____.

Distinguish *between the types of bonds that can form crystals.*

Bonds That Can Form Crystals	
Type of Bond	Example of Crystal
	sodium chloride

Summarize It

Summarize two of the main points of the above sections.

_____

_____

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Name _____ **Date** _____

Lesson 2 Forming Solids (continued)

Main Idea

Details

Crystals

I found this information on page _____.

Model *the* unit cell *for sodium chloride and quartz in the spaces below.*

Sodium Chloride	Quartz

What is a polymer?

I found this information on page _____.

Complete *the paragraph below about* polymers.

A _____ is a covalent compound made of many small, repeating units linked together in a _____. The word polymer means _____. A _____ is a small molecule that forms a link in a polymer chain. The monomer _____ links together to form polyethylene.

I found this information on page _____.

Classify *the examples of* polymers *in the table as synthetic or natural, and name the* monomer *that makes up each.*

Example	Type of Polymer	Monomer
Polyethylene		ethene
DNA		
Protein		
Carbohydrate		

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SUMMARIZE IT

Highlight the main idea of this section below.

Polymers are covalent compounds made up of repeating monomers. Polymers can be synthetic or natural. Examples of polymers include polyethylene, DNA, and carbohydrates.

Name _____ **Date** _____

Combining Atoms and Molecules

Chapter Wrap-Up

Now that you have read the chapter, think about what you have learned and complete the table below. Compare your previous answers to these.

1. Write an **A** if you agree with the statement.
2. Write a **D** if you disagree with the statement.

Combining Atoms and Molecules	After You Read
• The properties of a chemical compound are the same as the properties of each element it contains.	
• An atom that receives an electron becomes negatively charged.	
• Elements that are stable rarely form compounds.	
• Most elements are metals.	

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After studying the chapter, list three key concepts you have learned about chemical bonds.**

_____

_____

_____

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Name _____ **Date** _____

States of Matter

Grade 8 Science Content Standards—3.e: Students know that in solids the atoms are closely locked in position and can only vibrate; in liquids the atoms and molecules are more loosely connected and can collide with and move past one another; and in gases the atoms and molecules are free to move independently, colliding frequently. Also covers: 3.d, 5.d

Before You Read

Before you read the chapter, think about what you know about the topic. List three things that you already know about states of matter in the first column. Then list three things that you would like to learn about states of matter in the second column.

K What I know	W What I want to find out

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

List three differences between ice and water.

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Name _____ **Date** _____

States of Matter

Lesson 1 Solids, Liquids, and Gases

Grade 8 Science Content Standards—3.e: Students know that in solids the atoms are closely locked in position and can only vibrate; in liquids the atoms and molecules are more loosely connected and can collide with and move past one another; and in gases the atoms and molecules are free to move independently, colliding frequently. Also covers: 3.d

Scan *Lesson 1 of your book. Use the checklist below.*

- ☐ Read all the headings.
- ☐ Read all the bold words.
- ☐ Look at the charts and pictures.
- ☐ Think about what you already know about states of matter.

Write three things that you learn about states of matter.

1. _____

2. _____

3. _____

Review Vocabulary

Define matter *using your book or a dictionary.*

matter _____

New Vocabulary

Write a paragraph that uses all the vocabulary terms in a way that shows their meanings.

solid _____

gas _____

random motion _____

liquid _____

Academic Vocabulary

Use a dictionary to define distribute.

distribute _____

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Name _____ **Date** _____

Main Idea

What are states of matter?

I found this information on page _____.

I found this information on page _____.

Details

Identify *the 4* states of matter, *and give an example of each.*

Four States of Matter	
State	Example
1.	
2.	
3.	
4.	

Model *the movement of particles in matter by* random motion. *Show particles as dots, and use arrows to show the direction of movement. Write a caption to explain your model.*

Caption: _____

_____

_____

Summarize It

Summarize the main ideas of the above sections.

_____

_____

_____

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Name _____ **Date** _____

Lesson 1 Solids, Liquids, and Gases (continued)

Main Idea	Details

Solids

I found this information on page _____.

Identify *the main* characteristics of solids.

_____

_____

_____

Liquids

I found this information on page _____.

Compare *characteristics of* solids *and* liquids.

	Solids	Liquids
Shape	fixed	
Volume		fixed
Motion of particles		

Gases

I found this information on page _____.

Organize *information about* gases *in the outline.*

Characteristics of gases

1. Gas particles
   - **a.** _____
   - **b.** _____
2. Shape and volume of gases
   - **a.** _____
   - **b.** _____

Summarize It

Summarize three main ideas from the above sections.

_____

_____

_____

_____

_____

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Name _____ **Date** _____

States of Matter

Lesson 2 Changes in States of Matter

Grade 8 Science Content Standards—5.d: Students know physical processes include freezing and boiling, in which a material changes form with no chemical reaction. Also covers 3.d, 3.e

Skim *Lesson 2 of your text. Write three questions that come to mind.*

1. _____
2. _____
3. _____

Review Vocabulary

Define potential energy *using your book or a dictionary.*

potential energy _____

New Vocabulary

Read the definitions below. Write the correct vocabulary term on the blank to the left of each definition.

_____ temperature at which a liquid changes to a solid

_____ measure of the average kinetic energy of all the particles in an object

_____ change of a gas to a liquid

_____ temperature at which a solid changes to a liquid

_____ change of a liquid to a gas

_____ change of a solid to a gas without first going through the liquid state

_____ vaporization that occurs throughout a liquid

_____ vaporization at the surface of a liquid

_____ change of a gas to a solid without first going through the liquid state

_____ temperature at which a liquid changes to a gas

Academic Vocabulary

Use a dictionary to define **remove**.

remove _____

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Name _____ **Date** _____

Lesson 2 Changes in States of Matter (continued)

Main Idea

Details

Temperature, Thermal Energy, and Heat

I found this information on page _____.

Summarize *how* kinetic energy *is related to* temperature.

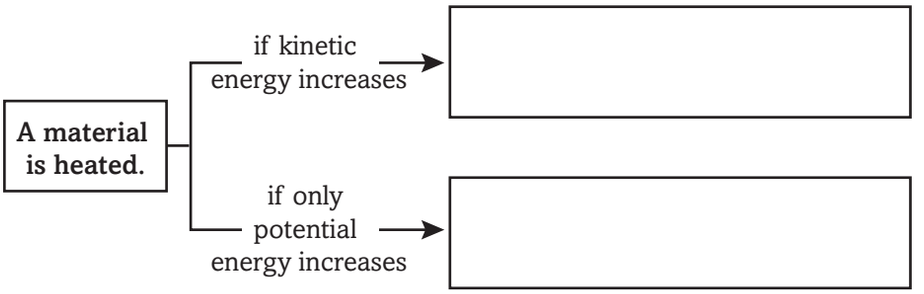
_____

_____

_____

I found this information on page _____.

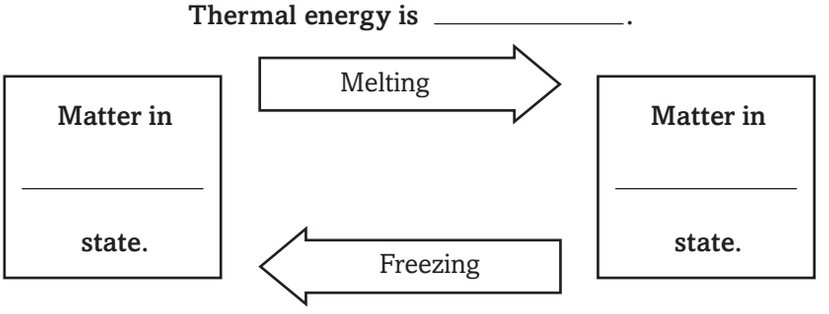
Distinguish *two ways a material can change when its* thermal energy increases.



Changes Between the Solid and Liquid States

I found this information on page _____.

Compare melting *and* freezing *by labeling the diagram.*



Summarize It

Summarize the main ideas of the above sections.

_____

_____

_____

_____

_____

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Name _____ **Date** _____

Lesson 2 Changes in States of Matter (continued)

Main Idea

Details

Changes Between Liquids and Gases

I found this information on page _____.

Compare and contrast vaporization, *and* condensation.

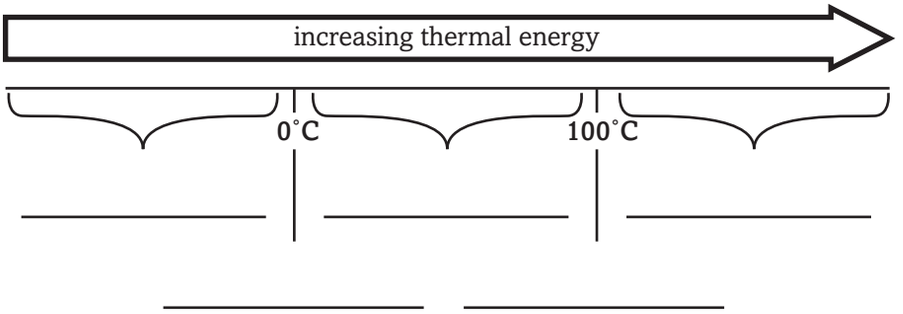
	What Happens	Location	Temperature
Vaporization: Boiling			
Vaporization: Evaporation			
Condensation			

Changing the State of Water

I found this information on page _____.

Label *the diagram below to show how a piece of ice changes as thermal energy is added to it. Use the terms provided.*

melting point boiling point solid gas liquid



_____ _____

Changes Between Solids and Gases

I found this information on page _____.

Contrast sublimation *and* deposition.

Sublimation: _____

Deposition: _____

Summarize It

Summarize the main ideas of the above sections.

_____

_____

_____

_____

_____

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Name _____ **Date** _____

States of Matter Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column.

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After reading the chapter, write three sentences summarizing the main ideas of the chapter.**

_____

_____

_____

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Name _____ Date _____

The Periodic Table and Physical Properties

Grade 8 Science Content Standards—3.f: Students know how to use the periodic table to identify elements in simple compounds. Also covers: 5.d, 7.a, 7.b, 7.c

Before You Read

Before you read the chapter, think about what you know about the topic. List three things that you already know about the periodic table and physical properties in the first column. Then list three things that you would like to learn about the topic in the second column.

K What I know	W What I want to find out

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Write a paragraph explaining why you think it's helpful to keep your books, notebooks, and papers organized.

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Name _____ **Date** _____

The Periodic Table and Physical Properties

Lesson 1 Organization of the Periodic Table

Grade 8 Science Content Standards—3.f: Students know how to use the periodic table to identify elements in simple compounds. Also covers: 7.a

Scan *Lesson 1 of your book. Write two facts you discovered about the periodic table while scanning the lesson.*

1. _____

_____

2. _____

_____

Review Vocabulary

Define element. *Then use the term in a sentence.*

element _____

_____

_____

New Vocabulary

Use your book or a dictionary to define the following terms.

period _____

group _____

conductivity _____

halogen _____

Academic Vocabulary

Use your book or a dictionary to define the term conduct *as it is used in the following sentence.*

The chairperson of the committee will conduct the meeting.

conduct _____

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Lesson 1 Organization of the Periodic Table (continued)

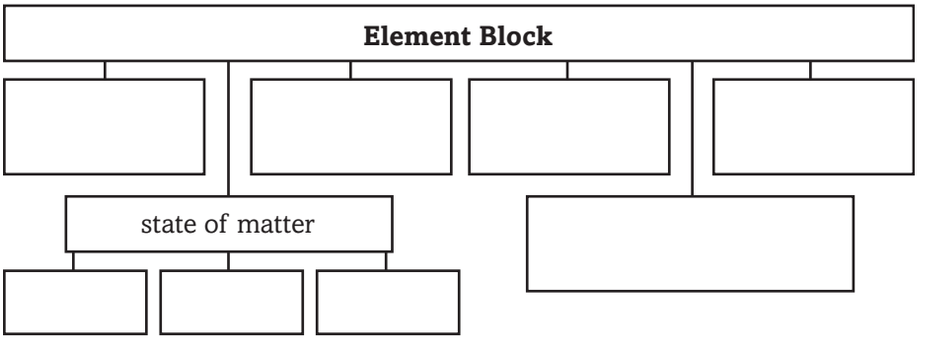
Main Idea

How are the elements arranged?

I found this information on page _____.

Details

Organize *the information found in an* element block *of the periodic table by filling in the graphic organizer.*



I found this information on page _____.

Outline *information about* periods *and* groups.

I. Periods

A. _____

B. _____

II. Groups

A. _____

B. Similar properties

1. Examples of chemical properties, Group 2

a. _____

b. _____

2. Examples of physical properties, Group 2

a. _____

b. _____

Summarize It

Summarize two main ideas of the above sections.

_____

_____

_____

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Lesson 1 Organization of the Periodic Table (continued)

Main Idea

Details

What are the regions of the periodic table?

I found this information on page _____.

Compare and contrast *the 3 regions of the periodic table.*

Region	Properties
Metals	
	semiconductors, properties of both metals and nonmetals

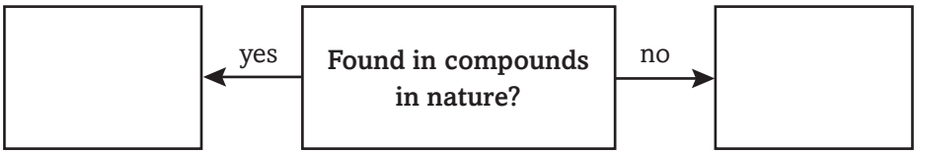
Identify *the areas of the periodic table in which* the most reactive metals and nonmetals *are found.*

_____

_____

I found this information on page _____.

Distinguish noble gases *from other nonmetals.*



Are there other periodic tables?

I found this information on page _____.

Analyze *why different periodic tables are available to scientists.*

_____

_____

_____

Summarize It

Summarize the main ideas of the above sections with two bullet points.

_____

_____

_____

_____

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The Periodic Table and Physical Properties

Lesson 2 Isotopes and Radioactivity

Grade 8 Science Content Standards—7.b: Students know each element has a specific number of protons in the nucleus (the atomic number) and each isotope of the element has a different but specific number of neutrons in the nucleus.

Scan *the lesson titles and bold words in Lesson 2. Write two facts that you discovered about the topic as you scanned the lesson.*

1. _____

2. _____

Review Vocabulary

Define isotopes *using your book or a dictionary.*

isotope _____

New Vocabulary

Match the correct term with its definition.

_____ time it takes for a sample of a radioactive element to decay to half its original mass

_____ change of an unstable atomic nucleus into another nucleus as it emits particles and energy

_____ element that has only radioactive isotopes

_____ radioactive element made by scientists or during nuclear reactions

_____ describes a nucleus that is unstable and undergoes radioactive decay

_____ machine capable of making particles move very quickly

_____ process in which an atom of one element is changed into an atom of another element

Academic Vocabulary

Use your book or a dictionary to find the scientific definition of the term **process.**

process _____

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Lesson 2 Isotopes and Radioactivity (continued)

Main Idea	Details

Isotopes - Different Numbers of Neutrons

I found this information on page _____.

Contrast *three* isotopes of carbon. *Complete the table.*

	Mass Number	Atomic Number	Number of Protons	Number of Neutrons
Carbon-12				
Carbon-13				
Carbon-14				

I found this information on page _____.

Analyze ***why isotopes have similar chemical properties.***

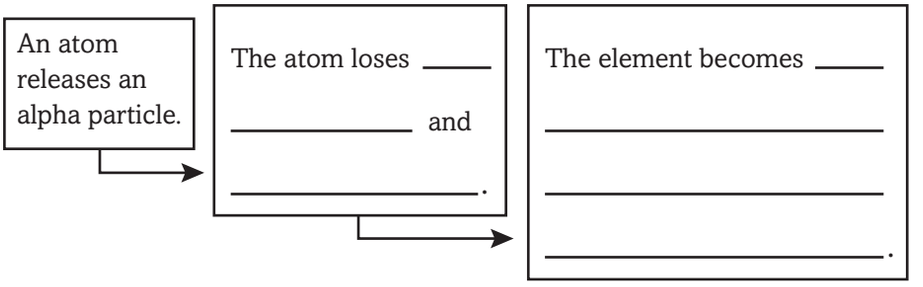
_____

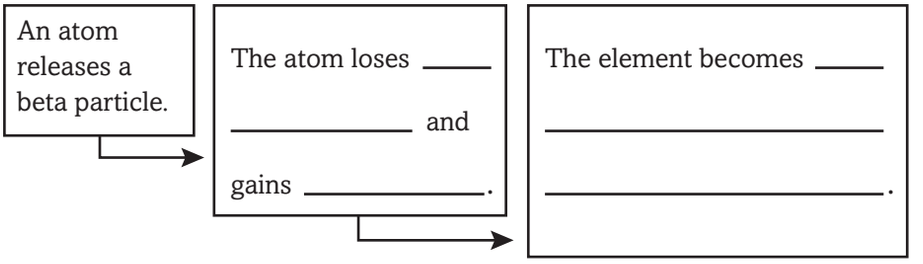
_____

What is radioactive decay?

I found this information on page _____.

Compare and contrast ***two types of*** **radioactive decay.** ***Complete the diagrams to show what happens when an atom releases an*** **alpha particle** ***and a*** **beta particle.**





SUMMARIZE IT

Write two sentences to summarize the above section.

_____

_____

_____

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Lesson 2 Isotopes and Radioactivity (continued)

Main Idea	Details
What is radioactive decay? *I found this information on page* _____. *I found this information on page* _____.	**Identify** *two* uses of radioactivity. 1. _____ 2. _____ **Summarize** *how uranium's long* half-life *explains why it is still found in nature.* _____ _____ _____
How are elements discovered and named? *Ifound this information on page* _____.	**Sequence** *the steps used by scientists to produce* synthetic elements. *Complete the flow chart.* Scientists bombard an atom with _____ _____. Particles might _____ _____. _____
I found this information on page _____.	**Create** *a concept map about the rules used by scientists to decide whether a new synthetic element has been created.* Rules for New Elements _____ _____ _____

SUMMARIZE IT

Summarize the main ideas of the above sections.

_____

_____

_____

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The Periodic Table and Physical Properties

Lesson 3 Physical Properties and Changes

Grade 8 Science Content Standards—5.d: Students know physical properties include freezing and boiling, in which a material changes form with no chemical reaction. Also covers: 7.c, 9.a

Skim *Lesson 3. Write two questions that come to mind. Look for the answers as you read.*

1. _____

2. _____

Review Vocabulary

Define density *using its scientific meaning.*

density _____

New Vocabulary

Use your book or a dictionary to define the following terms.

physical property _____

_____

melting point _____

_____

boiling point _____

_____

thermal conductivity _____

_____

physical change _____

_____

Academic Vocabulary

Use your book or a dictionary to define transfer.

transfer _____

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Name _____ **Date** _____

Lesson 3 Physical Properties and Changes (continued)

Main Idea	Details
What is a physical property?	**Create** *a graphic organizer to identify the 10* physical properties.
I found this information on page _____.	
I found this information on page _____.	**Draw** *and label an arrow to show how the* melting point *and* boiling point *of a substance depend on* the attraction between particles.
I found this information on page _____.	**Complete** *the following paragraph to summarize information about density and hardness.*

less attraction → more attraction

Density is the _____ of a substance. The density of a substance is _____ if its particles are packed tightly together. Hardness shows _____ _____.

SUMMARIZE IT

Summarize three main ideas from the above section.

_____

_____

_____

_____

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Name _____ **Date** _____

Lesson 3 Physical Properties and Changes (continued)

Main Idea | **Details**

What is a physical property?

I found this information on page _____.

Outline information ***about*** **thermal** ***and*** **electrical conductivity.**

I. Thermal conductivity

A. Ability to transfer heat through _____

B. _____

1. _____

2. _____

C. Low conductivity in gases

1. _____

2. _____

II. Electrical conductivity

A. Ability to transfer _____

B. _____

C. Plastic has _____.

What is a physical change?

I found this information on page _____.

Organize ***information about*** **examples of physical changes.**

Physical Change	Description	Example
Dissolving		
		mixing iron filings and sand
	changing a substance from its original state to a solid, liquid, or gas	

SUMMARIZE IT

Highlight one main idea of this section in the paragraph below.

Ice cream melts into a liquid. Bubble gum is blown into a sphere. A piece of modeling clay is shaped into a statue. These are physical changes. A physical change is any change in size, shape, or state of matter in which the identity of the substance remains unchanged.

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Name _____ **Date** _____

Tie It Together

The Periodic Table

Create a periodic table puzzle.

1. Obtain six pieces of paper. Cut each piece of paper into six equal pieces.
2. Make an element box for each of the first 36 elements in the periodic table. On each element box, fill in only part of the information shown on the periodic table. You might write the atomic mass, the atomic number, or the symbol.
3. Swap sets of partially completed element boxes with a partner.
4. Complete each element box in your partner's set.
5. Then, piece together your partner's periodic table in order.

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The Periodic Table and Physical Properties Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third .

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After reading this chapter, write one or two summary sentences for each lesson to illustrate the chapter's main ideas.**

_____

_____

_____

_____

_____

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Chemical Reactions

Grade 8 Science Content Standards—3.b: Students know that compounds are formed by combining two or more different elements and that compounds have properties different from their constituent elements. Also covers: 3.f, 5.a, 5.b, 5.c, 7.c

Before You Read

Before you read the chapter, think about what you know about the topic. List three things that you already know about the chemical reactions in the first column. Then list three things that you would like to learn about chemical reactions in the second column.

K What I know	W What I want to find out

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Write three questions you would like to ask a chemist about air bags.

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Chemical Reactions

Lesson 1 Chemical Properties and Changes

Grade 8 Science Content Standards—7.c: Students know substances can be classified by their properties, including their melting temperature, density, hardness, and thermal and electrical conductivity. Also covers: 5.a

Scan *the headings in Lesson 1 of your book. Identify three topics that will be discussed.*

1. _____
2. _____
3. _____

Review Vocabulary

Define physical property, *using your book or a dictionary. Then use the term in a scientific sentence.*

physical property

_____

_____

New Vocabulary

Write a paragraph using all of the vocabulary terms.

chemical property
chemical change
dissolving

_____

_____

_____

_____

_____

_____

_____

_____

_____

Academic Vocabulary

Use a dictionary to define compound.

compound

_____

_____

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Lesson 1 Chemical Properties and Changes (continued)

Main Idea

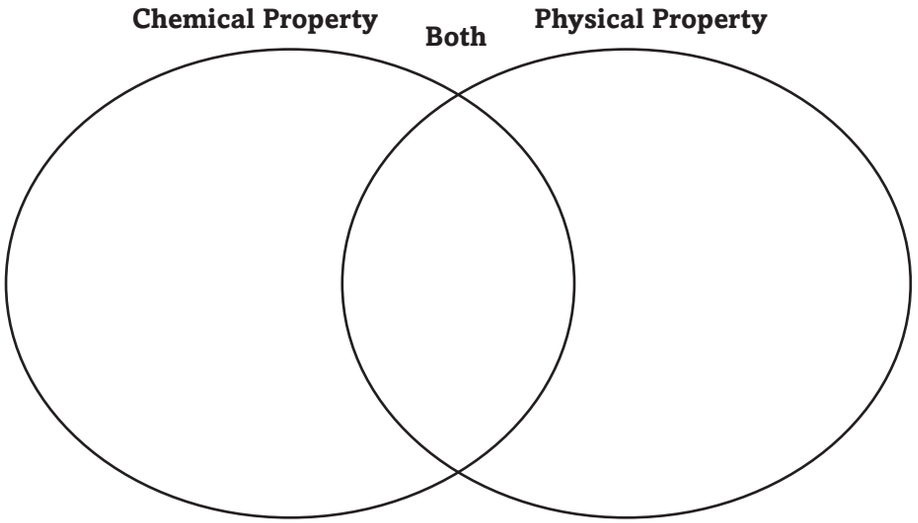
Ability to Change

I found this information on page _____.

Details

Compare and contrast chemical properties *and* physical properties *by filling in the Venn diagram using the phrases listed.*

- used to identify a substance
- observed without changing the identity of a substance
- ability to burn is an example
- color is an example
- observed by changing the identity of a substance



I found this information on page _____.

Identify *at least one chemical property for each substance.*

Substance	Chemical Property
Iron	
Paper	
Helium gas	
Hydrogen gas	
Copper	

Summarize It

Summarize the main ideas of the above section.

_____

_____

_____

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Lesson 1 Chemical Properties and Changes (continued)

Main Idea

Details

Ability to Change

I found this information on page _____.

Identify *six examples of* physical properties of matter.

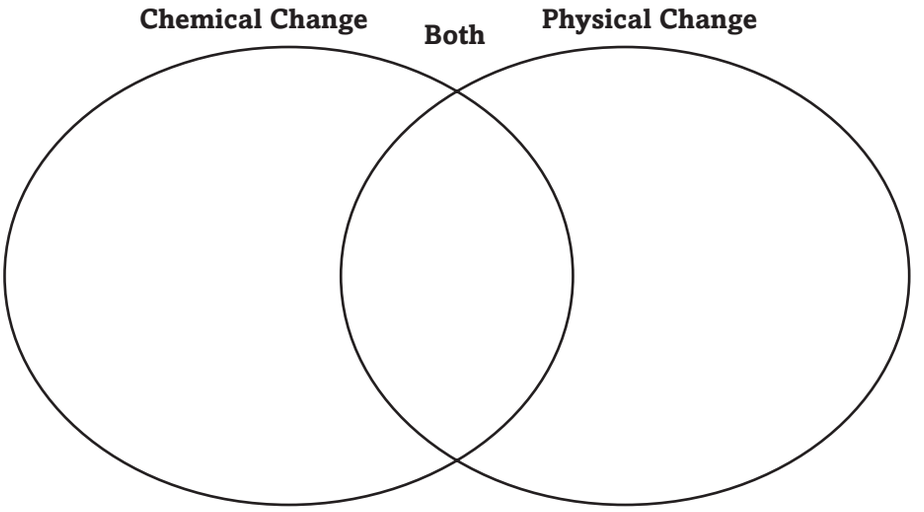
Examples of Physical Properties of Matter	
1.	4.
2.	5.
3.	6.

Chemical and Physical Changes

I found this information on page _____.

Compare and contrast chemical changes *and* physical changes *by completing the Venn diagram, using the phrases listed.*

- properties of substance change
- can often be reversed
- not easily reversed
- forms new substance
- identity of substance does not change
- dissolving is an example
- burning is an example
- includes changes of state



Summarize It

Summarize three main ideas of the above sections.

_____

_____

_____

_____

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Chemical Reactions

Lesson 2 Chemical Equations

Grade 8 Science Content Standards—3.b: Students know that compounds are formed by combining two or more different elements and that compounds have properties different from their constituent elements. Also covers: 3.f, 5.b

Skim *Lesson 2 of your book. Write three questions that come to mind. Look for answers to your questions as you read the lesson.*

1. _____
2. _____
3. _____

Review Vocabulary

Define molecule, *using your book or a dictionary.*

molecule

_____

_____

New Vocabulary

Read the definitions below. Write the correct vocabulary term on the blank to the left of each definition.

_____ new substance formed in a chemical reaction

_____ scientific principle stating that the total mass before a chemical reaction is the same as the total mass after the reaction

_____ molecule that contains two atoms

_____ starting substance in a chemical reaction

_____ number in front of a symbol or formula that tells how many molecules or formula units take part in a reaction

Academic Vocabulary

Use a dictionary to define precise. *Then use the term in a sentence to show how it is used in science.*

precise

_____

_____

_____

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Lesson 2 Chemical Equations (continued)

Main Idea

Details

Is matter conserved in chemical reactions?

I found this information on page _____.

Rephrase *the* law of conservation of mass *in your own words.*

_____

_____

_____

How do you write a chemical equation?

I found this information on page _____.

Label *the* reactants *and* product *in the equation below.*

tin + oxygen gas → tin oxide

Summarize *two limitations of word equations.*

_____

_____

I found this information on page _____.

Distinguish *between an* element, *a* diatomic molecule, *and a* compound. *Give an example of each, including the symbol.*

	What is it?	Example	Symbol
Element			
Diatomic molecule			
Compound			

Summarize It

Summarize the main ideas of the above sections of this lesson.

_____

_____

_____

_____

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Lesson 2 Chemical Equations (continued)

Main Idea

How do you balance a chemical equation?

I found this information on page _____.

Details

Analyze *when a chemical equation is balanced.*

_____

_____

Contrast *the use of* subscripts *and* coefficients *in chemical equations.*

Subscript	Coefficient
Tells	Tells

Equations for Common Chemical Reactions

I found this information on page _____.

Sequence *the steps involved in balancing an equation. Complete the flow chart.*

Write the _____.

↓

Count _____.

↓

Place coefficients _____

_____.

Complete *each equation below to summarize its chemical reaction.*

Reaction of methane:

_____ + _____ O_2 → CO_2 + _____ H_2O

Baking soda and vinegar:

_____ + _____ → _____ + _____ + $NaC_2H_3O_2$

Summarize It

Summarize two main ideas from the above sections.

_____

_____

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Chemical Reactions

Lesson 3 Energy and Chemical Change

Grade 8 Science Content Standards—5.c: Students know chemical reactions usually liberate heat or absorb heat.

Scan *Lesson 3 of your book. Look at the headings, bold words, and pictures. Write three facts that you learn about energy and chemical change.*

1. _____

_____

2. _____

_____

3. _____

_____

Review Vocabulary

Use chemical bond *in a sentence to show its scientific meaning.*

chemical bond _____

New Vocabulary

Define *each vocabulary term, using your book or a dictionary.*

law of conservation of energy _____

_____

exothermic process _____

endothermic process _____

Academic Vocabulary

Use a dictionary to define function. *Then write a sentence to show its scientific meaning.*

function _____

_____

_____

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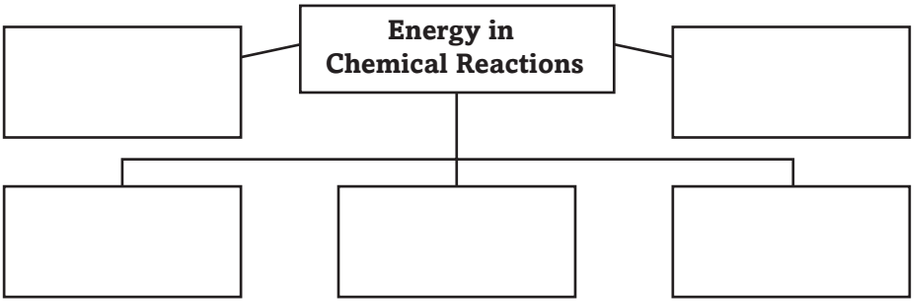
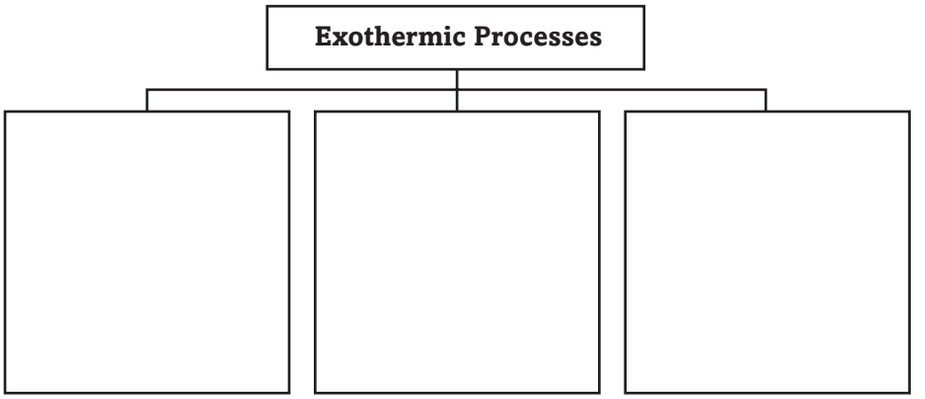
Lesson 3 Energy and Chemical Change (continued)

Main Idea	Details
Energy and Chemical Reactions *I found this information on page* _____.	**Identify** *five forms of energy that are released or used in chemical reactions.* 
I found this information on page _____.	**Rephrase** *the* law of conservation of energy *in your own words.* _____ _____ _____
Net Release of Energy *I found this information on page* _____.	**Organize** *information about* exothermic processes. *Complete the concept map.* 

SUMMARIZE IT

Summarize the main ideas of the above sections of this lesson.

_____

_____

_____

_____

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Name _____ **Date** _____

Main Idea

Details

Net Absorption of Energy

I found this information on page _____.

Outline *information about* **endothermic processes.**

I. Properties of endothermic processes

A. _____

B. _____

C. _____

II. Examples of exothermic processes

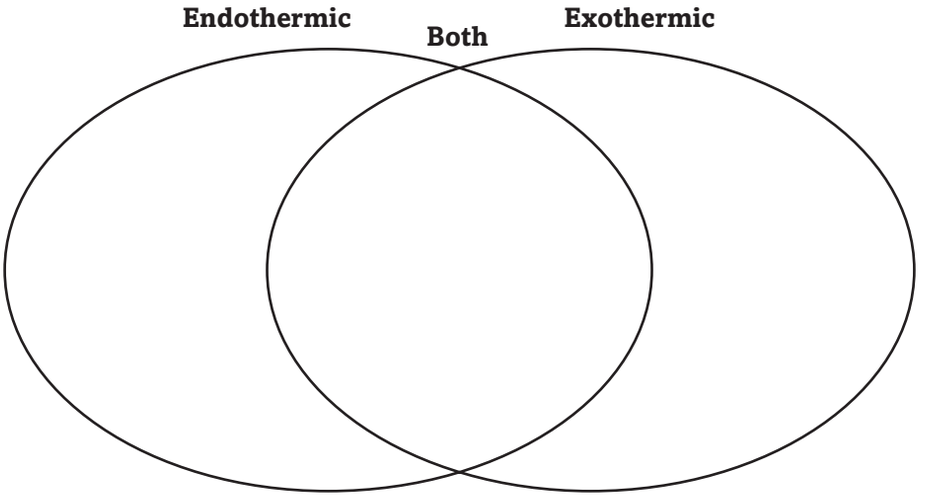
A. _____

B. _____

I found this information on page _____.

Compare and contrast ***endothermic and exothermic processes by completing the Venn diagram with the terms below.***

- net absorption of energy
- net release of energy
- may involve heat
- occurs as bonds break and reform



Summarize It

Summarize the main ideas of this section in two bullet points.

_____

_____

_____

_____

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Tie It Together

Chemical Reactions

Use the information in the paragraph below and what you learned in the chapter to balance the chemical equation given and answer the questions.

Photosynthesis is the process by which plants make food in the form of the sugar glucose ($C_6H_{12}O_6$). Plants make glucose by using light energy to combine carbon dioxide (CO_2) and water (H_2O). In addition to glucose, oxygen (O_2) is also formed. The chemical equation for photosynthesis is shown.

Chemical Equation for Photosynthesis: $CO_2 + H_2O + \text{Light Energy} \rightarrow C_6H_{12}O_6 + O_2$

Count the atoms in the reactants and products.

Reactants: _____ + _____	Products: _____ + _____
Number of carbon atoms: _____	Number of carbon atoms: _____
Number of hydrogen atoms: _____	Number of hydrogen atoms: _____
Number of oxygen atoms: _____	Number of oxygen atoms: _____

Balanced Equation: $6CO_2 + 6H_2O + \text{energy} \rightarrow C_6H_{12}O_6 + 6O_2$

Count the atoms on each side of the balanced equation.

Reactants:	Products:
Number of carbon atoms: _____	Number of carbon atoms: _____
Number of hydrogen atoms: _____	Number of hydrogen atoms: _____
Number of oxygen atoms: _____	Number of oxygen atoms: _____

Analysis

1. Summarize photosynthesis in a word equation.

_____

_____

2. Classify photosynthesis as an endothermic or an exothermic reaction. Support your response with a specific example.

_____

_____

_____

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Name _____ **Date** _____

Chemical Reactions Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column.

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After reading the chapter, write a sentence or two summarizing the main idea of each lesson.**

_____

_____

_____

_____

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Name _____ **Date** _____

Acids and Bases in Solution

Grade 8 Science Content Standards—5.e: Students know how to determine whether a solution is acidic, basic, or neutral. Also covers: 7.c

Before You Read

Before you read the chapter, respond to these statements.

1. Write an **A** if you agree with the statement.
2. Write a **D** if you disagree with the statement.

Before You Read	Acids and Bases in Solution
	• A compound is a type of mixture.
	• You can dissolve any amount of salt in a glass of water.
	• Soap is acidic.
	• A substance that is neutral is neither an acid nor a base.

FOLDABLES™ Study Organizer

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Write a brief paragraph on what you think these rocks are made from.

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Name _____ **Date** _____

Acids and Bases in Solution

Lesson 1 Solutions

Grade 8 Science Content Standards—7.c: Students know substances can be classified by their properties, including their melting temperature, density, hardness, and thermal and electrical conductivity.

Scan *the* **What You'll Learn** *statements for Lesson 1 of your book. Identify two topics that will be discussed.*

1. _____

2. _____

Review Vocabulary

Define **liquid** *using your book or a dictionary.*

liquid _____

_____

New Vocabulary

Read the definitions below. Write the correct vocabulary term on the blank to the left of each definition.

_____ homogeneous mixture

_____ matter that has the same composition and properties throughout

_____ mixture in which the substances are not evenly mixed

_____ substance that dissolves in a solution

_____ two or more substances that are evenly mixed on the atomic level but are not bonded together

_____ substance used to dissolve a solute

_____ combination of two or more substances that can be separated by physical means

Academic Vocabulary

Use a dictionary to define **individual.**

individual _____

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Name _____ **Date** _____

Lesson 1 Solutions (continued)

Main Idea

What are the types of matter?

I found this information on page _____.

Details

Define *the two main* categories of matter.

Categories of matter

- Substance:
- Mixture:

I found this information on page _____.

Organize *information about the 2 types of* mixtures. *Describe and give an example of each.*

Homogeneous Mixture	Heterogeneous Mixture

I found this information on page _____.

Contrast *the three solutions below. Identify the state of the* solution, solvent, *and* solute. *Describe how solutions are classified.*

	Air	Soft Drink	14K Gold Alloy
Solution			
Solvent			
Solute			

_____

_____

SUMMARIZE IT

Summarize three main ideas of the above sections.

_____

_____

_____

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Name _____ **Date** _____

Lesson 1 Solutions (continued)

Main Idea

Details

Separating Mixtures by Physical Means

I found this information on page _____.

Identify *four* physical properties *or* physical changes *that can be used to separate mixtures.*

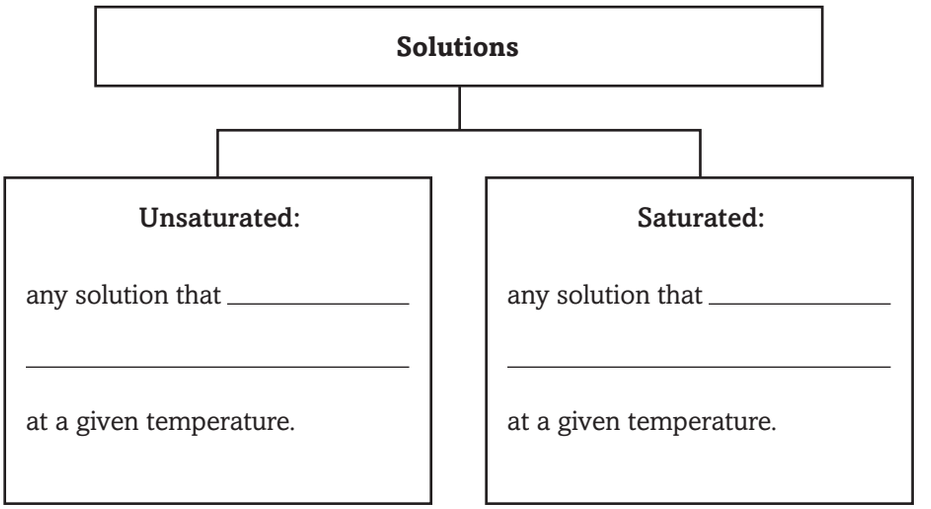
1. _____ 3. _____

2. _____ 4. _____

Solubility—How much can dissolve?

I found this information on page _____.

Distinguish *between* saturated *and* unsaturated *solutions.*



Concentration—How much is dissolved?

I found this information on page _____.

Analyze *the solutions below. Write the* concentration *of the solution in grams per liter or as a percent.*

Solution A: 10 g sodium chloride in 2 L solution

Concentration: _____

Solution B: 4 mL ethanol in 100 mL solution

Percent by Volume: _____

SUMMARIZE IT

Summarize three main ideas of the above sections.

_____

_____

_____

_____

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Name _____ **Date** _____

Main Idea

Water as a Solvent

I found this information on page _____.

Details

Model *a molecule of water to show its* polarity. *Mark the positive areas with a + and the negative areas with a –. Label the* oxygen atoms, hydrogen atoms, *and* shared electrons.

I found this information on page _____.

Complete *the table to show how water molecules attract* polar molecules *and* ionic compounds.

	Polar Molecule	Ionic Compound
Attracted by positive end of water molecule		
Attracted by negative end of water molecule		

I found this information on page _____.

Contrast electrolytes *and* nonelectrolytes. *Complete the flow chart.*

Does the substance form ions in water?

- yes → The substance is _____ and _____ conduct electricity in solution.
- no → The substance is _____ and _____ conduct electricity in solution.

SUMMARIZE IT

Summarize three main ideas of the above sections.

_____

_____

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Name _____ **Date** _____

Acids and Bases in Solution

Lesson 2 Acidic, Basic, and Neutral Solutions

Grade 8 Science Content Standards—5.e: Students know how to determine whether a solution is acidic, basic, or neutral.

Skim *Lesson 2 of your book. Write three questions that come to mind. Look for answers to your questions as you read the lesson.*

1. _____

2. _____

3. _____

Review Vocabulary

Define atom *using your book or a dictionary.*

atom _____

New Vocabulary

Write a paragraph using all the vocabulary terms in a way that shows their meanings.

acid
hydronium ion
base
pH
indicator
pH meter

Academic Vocabulary

Define approximate, *using your book or a dictionary. Then use it in a sentence to show its scientific meaning.*

approximate _____

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Lesson 2 Acidic, Basic, and Neutral Solutions (continued)

Main Idea

What are acids and bases?

I found this information on page _____.

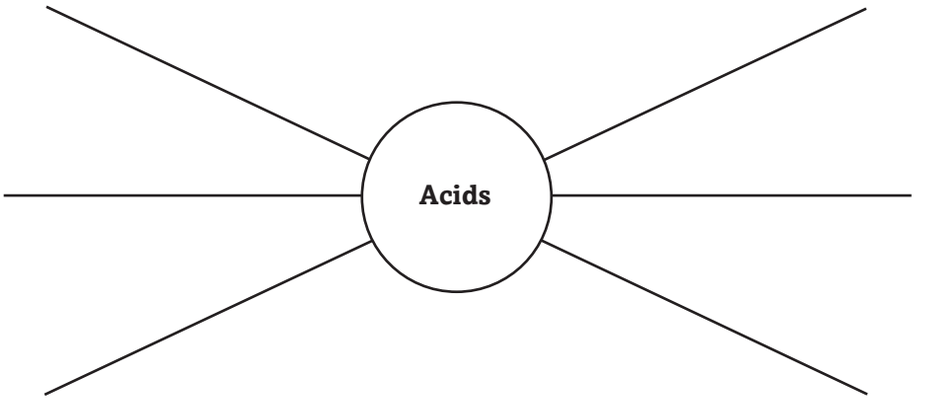
Identify *at least two examples of everyday* acids *and* bases.

Acids	Bases

Acids

I found this information on page _____.

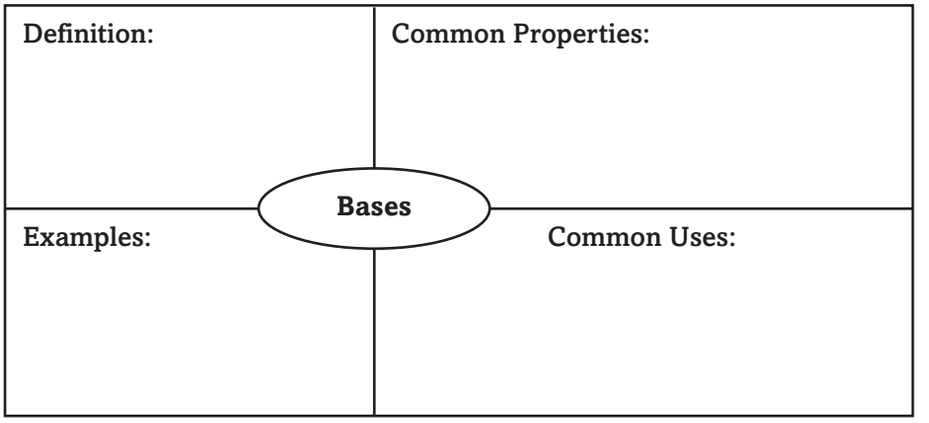
Summarize *important facts about* acids. *List one fact on each line.*



Bases

I found this information on page _____.

Organize *information about* bases. *Complete the diagram.*



Details

Summarize It

Summarize the main ideas of the above sections with two bullet points.

_____

_____

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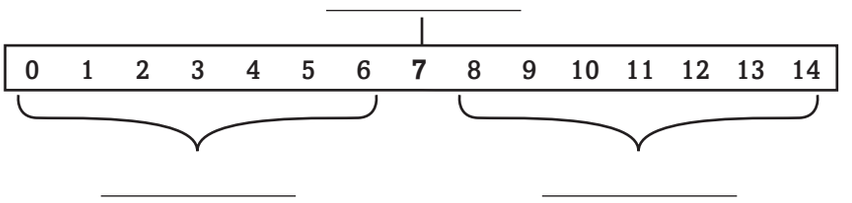
Name _____ **Date** _____

Lesson 2 Acidic, Basic, and Neutral Solutions (continued)

Main Idea	Details
What is pH? *I found this information on page _____.*	**Label** *the locations of* acids, bases, *and* neutral substances *on the pH scale below. Draw arrows to show how the concentrations of* hydronium ions *and* hydroxide ions *change across the pH scale.*  Hydronium ions Hydroxide ions
I found this information on page _____.	**Complete** *the equations below to compare* pH values. A substance with pH 2 and a substance with pH 1 _____ − _____ = _____; 10^n = _____ = _____ times more acidic A substance with pH 5 and a substance with pH 2 _____ − _____ = _____; 10^n = _____ = _____ times more acidic
I found this information on page _____.	**Define** neutralization. _____ _____

SUMMARIZE IT **Summarize three main ideas of the above sections using bullet points.**

_____

_____

_____

_____

_____

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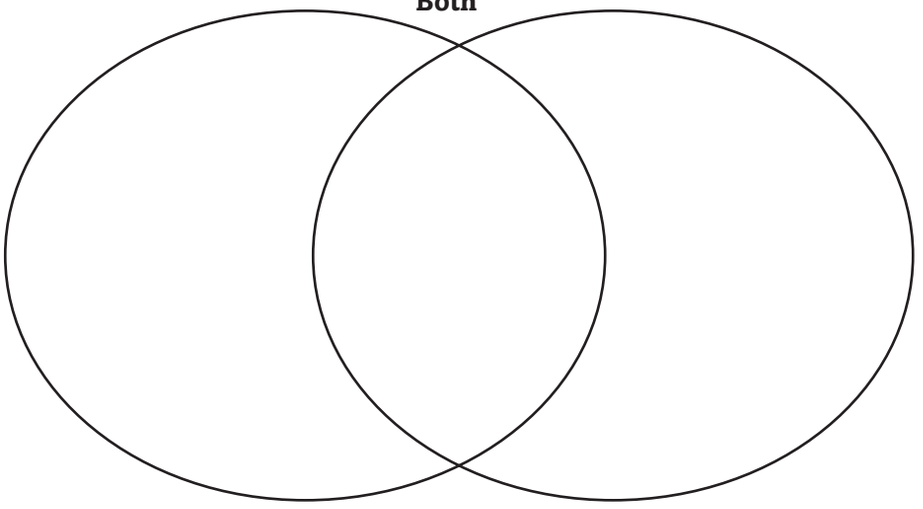
Name _____ **Date** _____

Lesson 2 Acidic, Basic, and Neutral Solutions (continued)

Main Idea	Details
What is pH? *I found this information on page* _____.	**Label** ***the neutralization reaction below to identify its reactants and products as an acid, a salt, a base, and water.*** $2HCl + Mg(OH)_2 \quad MgCl_2 + 2H_20$ _____ + _____ _____ + _____
How is pH measured? *I found this information on page* _____.	**Compare and contrast** ***the methods for measuring pH. Complete the Venn diagram with the facts below. Then describe what a*** **pH meter** ***is.*** • change color • universal indicator is an example • litmus paper is an example • approximate pH **Indicators** **Both** **pH Strips**  A pH meter is an _____ with an _____ that is sensitive to the _____ in a solution.

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SUMMARIZE IT

Summarize three main ideas of the above sections.

_____

_____

_____

Name _____ Date _____

Acids and Bases in Solution

Chapter Wrap-Up

Now that you have read the chapter, think about what you have learned and complete the table below. Compare your previous answers to these.

1. Write an **A** if you agree with the statement.
2. Write a **D** if you disagree with the statement.

Acids and Bases in Solution	After You Read
• A compound is a type of mixture.	
• You can dissolve any amount of salt in a glass of water.	
• Soap is acidic.	
• A substance that is neutral is neither an acid nor a base.	

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After studying the chapter, write one summary sentence for each lesson to illustrate the chapter's main ideas.**

_____

_____

_____

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Name _____ Date _____

Chemistry of Living Systems

Grade 8 Science Content Standards—6.b: Students know that living organisms are made of molecules consisting largely of carbon, hydrogen, oxygen, phosphorus, and sulfur. Also covers: 3.c, 6.a, 6.c

Before You Read

Before you read the chapter, think about what you know about the topic. List three things that you already know about the chemistry of living systems in the first column. Then list three things that you would like to learn about the chemistry of living systems in the second column.

K What I know	W What I want to find out

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

What molecules do you think bears and humans have in common?

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Name _____ **Date** _____

Chemistry of Living Systems

Lesson 1 Chemistry of Life

Grade 8 Science Content Standards—6.b: Students know that living organisms are made of molecules consisting largely of carbon, hydrogen, nitrogen, oxygen, phosphorus, and sulfur. Also covers: 6.a, 6.c

Scan *Lesson 1 of your book. Read the headings and bold words and look at the pictures. Write three things that you discovered about the chemistry of living systems.*

1. _____

2. _____

3. _____

Review Vocabulary

Define element *as it is used in science. Use your book or a dictionary to help.*

element _____

New Vocabulary

Use your book or a dictionary to define the vocabulary terms.

biomass _____

_____

polar molecule _____

_____

nonpolar molecule _____

_____

Academic Vocabulary

Use your book or a dictionary to define cycle. *Then use it in a sentence to show its scientific meaning.*

cycle _____

_____

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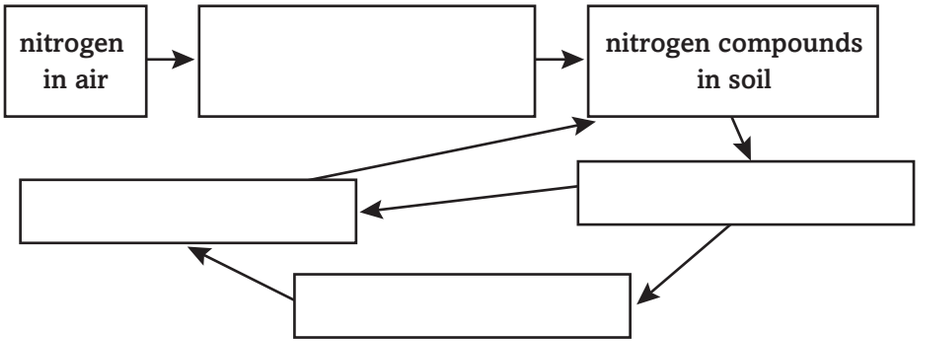
Name _____ **Date** _____

Lesson 1 Chemistry of Life (continued)

Main Idea	Details
Elements of Life *I found this information on page _____.*	**Identify** *the 6 elements that make up most of Earth's* biomass. **1.** _____ **4.** _____ **2.** _____ **5.** _____ **3.** _____ **6.** _____
Cycles in Life *I found this information on page _____.*	**Create** *a cycle map in the space below showing the movement of carbon in the* carbon cycle. *Include labels to identify the form of carbon at each stage of the cycle. Use arrows to link the processes.*
I found this information on page _____.	**Model** *the path of* nitrogen *as it cycles through the environment. Complete the flow chart.*



Summarize It

Summarize the main ideas of the above sections.

_____

_____

_____

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Name _____ **Date** _____

Main Idea

Details

Cycles of Matter

I found this information on page _____.

Summarize *how* phosphorus cycles *through the environment.*

_____

_____

_____

Water and Living Organisms

I found this information on page _____.

Analyze *the* importance of water to organisms. *Complete the table.*

Organisms	How Water is Used
Animals	
Plants	
One-celled organisms	

I found this information on page _____.

Outline *information about* the unique characteristics of water.

I. Resistance to temperature change

A. _____

B. _____

II. Density

A. _____

B. _____

III. Polarity

A. _____

B. _____

C. _____

SUMMARIZE IT

Summarize two main ideas of the above sections.

_____

_____

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Name _____ **Date** _____

Chemistry of Living Systems

Lesson 2 Carbon Compounds

Grade 8 Science Content Standardss—6.a: Students know that carbon, because of its ability to combine in many ways with itself and other elements, has a central role in the chemistry of living organisms. Also covers: 3.c, 6.b, 6.c

Skim *Lesson 2 of your book. Write three questions that come to mind. Look for answers to your questions as you read the lesson.*

1. _____
2. _____
3. _____

Review Vocabulary

Define covalent bond *using your book or a dictionary.*

covalent bond _____

New Vocabulary

Write the correct vocabulary term on the blank to the left of each definition.

_____ molecule that contains only carbon and hydrogen atoms

_____ compound that contains at least one double or triple bond between carbon atoms

_____ group of atoms that replaces a hydrogen atom in an organic compound

_____ compound that contains the element carbon

_____ organic compound that is a basic building block of proteins

_____ compound that contains only single bonds between carbon atoms

Academic Vocabulary

Use your book or a dictionary to define the scientific meaning of **substitute.**

substitute _____

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Name _____ **Date** _____

Main Idea

Organic Compounds

I found this information on page _____.

I found this information on page _____.

I found this information on page _____.

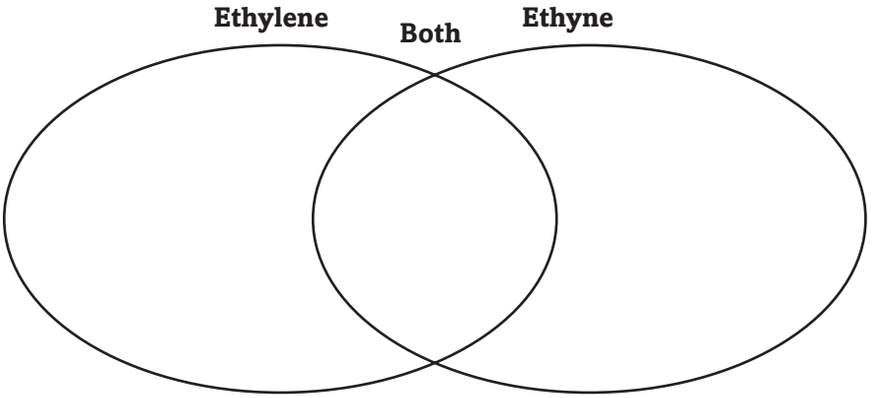
Details

Identify the element found in all organic compounds.

_____

Compare and contrast ethylene *and* ethyne *by using the phrases listed to fill in the graphic organizer.*

- plant hormone
- organic compound
- used for welding
- double bond between carbon atoms
- triple bond between carbon atoms
- made up only of carbon and hydrogen



Classify *the 2 groups of* hydrocarbon compounds.

	Saturated	Unsaturated
Bonds between carbon atoms		
Examples		

Summarize It

Summarize two main ideas of the above section.

_____

_____

_____

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Name _____ **Date** _____

Main Idea

Organic Compounds

I found this information on page _____.

Details

Model *the first four* hydrocarbons. *Draw each compound and write its chemical formula.*

Methane	Ethane	Propane	Butane
Formula:	Formula:	Formula:	Formula:

Complete *the table to summarize what information each part of a hydrocarbon's name provides.*

Prefix	Root	Suffix

Analyze *the hydrocarbons below. Identify* how many carbon atoms *are in each hydrocarbon and* what type of bonds *the carbon forms.*

Name: Hexene

Carbon atoms: _____

Type of bonds: _____

Name: Butyne

Carbon atoms: _____

Type of bonds: _____

Summarize It

Rephrase two main ideas of the above section.

_____

_____

_____

_____

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Name _____ **Date** _____

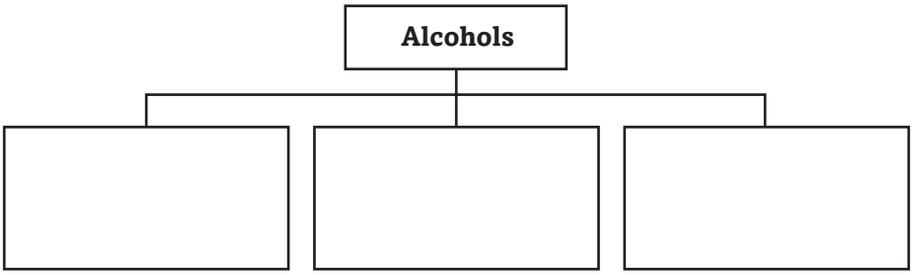
Main Idea

Substituted Hydrocarbons

I found this information on page _____.

Details

Organize *information about* alcohols. *Complete the concept map.*



Summarize *the functional group found in* carboxylic acids.

_____

_____

Contrast *the functional groups found in* amines *and* amino acids.

	Amines	Amino Acids
Functional group(s)		

Shapes of Molecules

I found this information on page _____.

Create *drawings to show* linear, planar, *and* tetrahedral *molecules.*

Linear	Planar	Tetrahedral

Summarize It

Summarize the main ideas of the above sections.

_____

_____

_____

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Chemistry of Living Systems

Lesson 3 Compounds of Life

Grade 8 Science Content Standards—6.c: Students know that living organisms have many different kinds of molecules, including small ones, such as water and salt, and very large ones, such as carbohydrates, fats, proteins, and DNA. Also covers: 6.a, 6.b

Scan *the headings of Lesson 3 of your book. Predict three topics that will be discussed.*

1. _____
2. _____
3. _____

Review Vocabulary

Define compound *using your book or a dictionary.*

compound _____

New Vocabulary

Use your book or a dictionary to define the following terms.

lipid _____

biomolecule _____

nucleic acid _____

carbohydrate _____

synthetic polymer _____

monomer _____

Academic Vocabulary

Define random *using a dictionary. Then use the term in a sentence to show its scientific meaning.*

random _____

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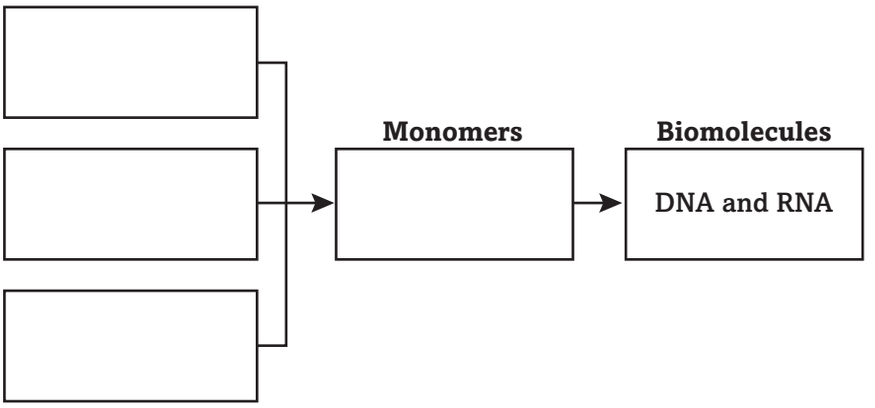
Name _____ **Date** _____

Lesson 3 Compounds of Life (continued)

Main Idea	Details
Polymers *I found this information on page _____.*	**Complete** *the statement to describe* polymers. Polymers are made up of _____ and can be _____ or _____.
Biological Molecules *I found this information on page _____.*	**Identify** *the* biomolecules *formed by the joining of each type of monomer.* Amino acids: _____ Sugars: _____ Nucleotides: _____
	Summarize the chemical composition of a lipid. _____ _____
I found this information on page _____.	**Analyze** *the structure of* DNA *and* RNA. *Complete the diagram.*



Summarize It

Summarize three main ideas from the above sections.

_____

_____

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_____

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Lesson 3 Compounds of Life (continued)

Main Idea	Details

Biological Molecules

I found this information on page _____.

Contrast *the 2 main* **types of fats.**

Saturated fats have _____ bonds between carbon atoms and are _____ at room temperature. Unsaturated fats have _____ _____ and are _____ at room temperature.

Create *a concept map about* **complex carbohydrates.** ***Include at least three facts.***

Other Elements in the Human Body

I found this information on page _____.

Identify the function of each element in the human body.

1. Fluorine _____
2. Iron _____
3. Magnesium _____
4. Calcium _____
5. Copper _____
6. Sulfur _____

SUMMARIZE IT

Summarize the main ideas of the above sections.

_____

_____

_____

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Chemistry of Living Systems

Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column.

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After studying the chapter, write one summary sentence for each lesson to illustrate the chapter's main ideas.**

_____

_____

_____

_____

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Our Solar System

Grade 8 Science Content Standards—4.e: Students know the appearance, general composition, relative position and size, and motion of objects in the solar system, including planets, planetary satellites, comets, and asteroids. Also covers: 2.g, 4.c, 4.d

Before You Read

Before you read the chapter, think about what you know about the topic. List three things that you already know about the solar system in the first column. Then list three things that you would like to learn about the solar system in the second column.

K What I know	W What I want to find out

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

How do you define a planet? Make a list of several criteria you would use to decide which objects would be classifed as planets.

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Name _____ **Date** _____

Our Solar System

Lesson 1 Structure of the Solar System

Grade 8 Science Content Standards—4.e: Students know the appearance, general composition, relative position and size, and motion of objects in the solar system, including planets, planetary satellites, comets, and asteroids. Also covers: 2.g, 4.c, 4.d

Skim *Lesson 1. Pay attention to the section headings and bold words. Write 3 topics you predict will be covered in this lesson.*

1. _____

2. _____

3. _____

Review Vocabulary

Define balanced forces *using your book or a dictionary.*

balanced forces _____

New Vocabulary

Use your book or a dictionary to define the following terms.

axis of rotation _____

period of rotation _____

period of revolution _____

ellipse _____

astronomical unit _____

planet _____

Academic Vocabulary

Use your book or a dictionary to define force. *Then use the term in a scientific sentence.*

force _____

_____

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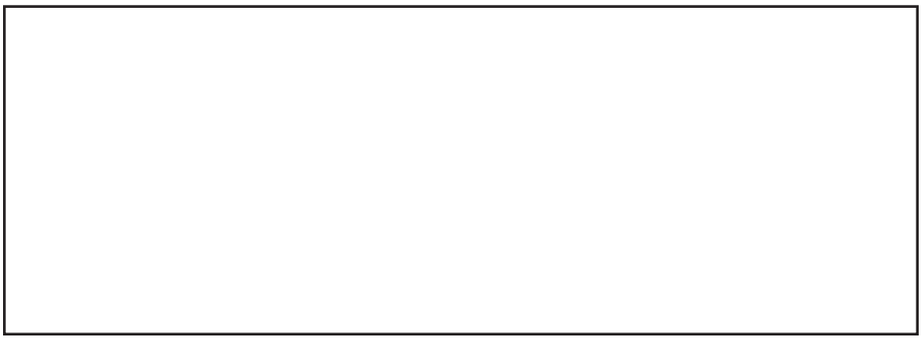
Name _____ **Date** _____

Lesson 1 The Structure of the Solar System (continued)

Main Idea	Details
What is the solar system? *I found this information on page _____.*	**Complete** *the statement about the* solar system. The solar system includes _____ _____
The Motion of Planets *I found this information on page _____.*	**Distinguish** *between the* period of rotation *and the* period of revolution *of a planet. Define each term below.* A planet's period of rotation is _____ _____. A planet's period of revolution is _____.
Kepler's Laws of Planetary Motion *I found this information on page _____.*	**Model** *the* orbit of a planet. *Draw the planet's orbit according to* Kepler's first law.  **Rephrase** Kepler's second and third laws *in your own words.* **Kepler's Second Law:** _____ _____ **Kepler's Third Law:** _____ _____

SUMMARIZE IT

Summarize one main idea from each section above.

_____

_____

_____

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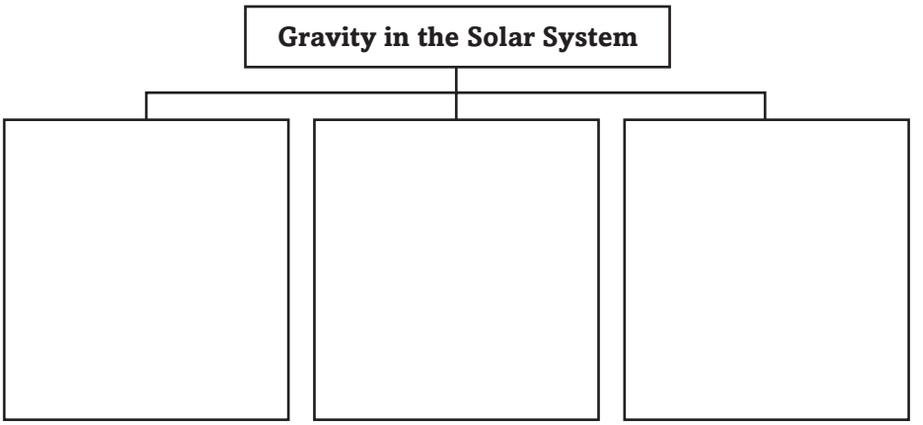
Lesson 1 Structure of the Solar System (continued)

Main Idea	Details
The Astronomical Unit *I found this information on page _____.*	**Analyze** *why the* astronomical unit *is used to measure distance in the solar system.* The astronomical unit is used because _____ _____ _____.
Gravity and the Solar System *I found this information on page _____.*	**Design** *a graphic organizer to summarize at least three key facts about gravity and its role in the solar system.* 
Formation of the Solar System *I found this information on page _____.*	**Sequence** *the events that* formed the solar system. **1.** A cloud of gas and dust called a nebula formed. **2.** _____ **3.** _____ **4.** _____ **5.** _____

SUMMARIZE IT

Summarize three main ideas from the above sections.

_____

_____

_____

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Name _____ **Date** _____

Our Solar System

Lesson 2 The Sun-Earth-Moon System

Grade 8 Science Content Standards—4.d: Students know that stars are the source of light for all bright objects in outer space and that the Moon and planets shine by reflected sunlight, not by their own light.

Scan *the headings, illustrations, and bold words in Lesson 2. Write three questions you have. Look for the answers as you read.*

1. _____
2. _____
3. _____

Review Vocabulary

Define gravity *using your book or a dictionary.*

gravity _____

New Vocabulary

Define *each term below using your book or a dictionary. Then use the terms in a short paragraph about the Moon.*

satellite _____

lunar phase _____

eclipse _____

Academic Vocabulary

Use a dictionary to define phase.

phase _____

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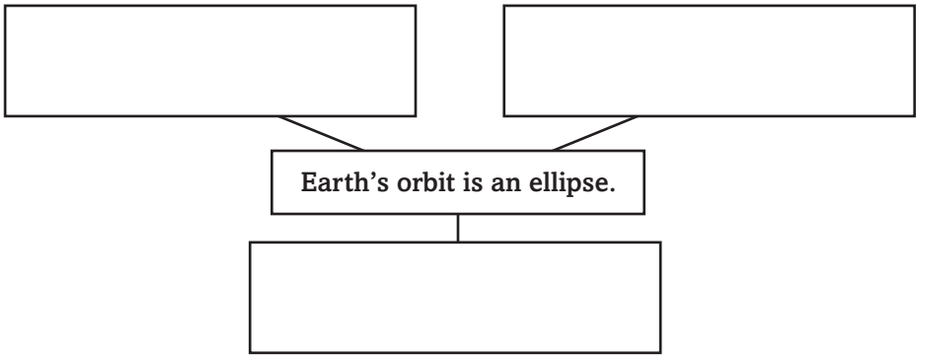
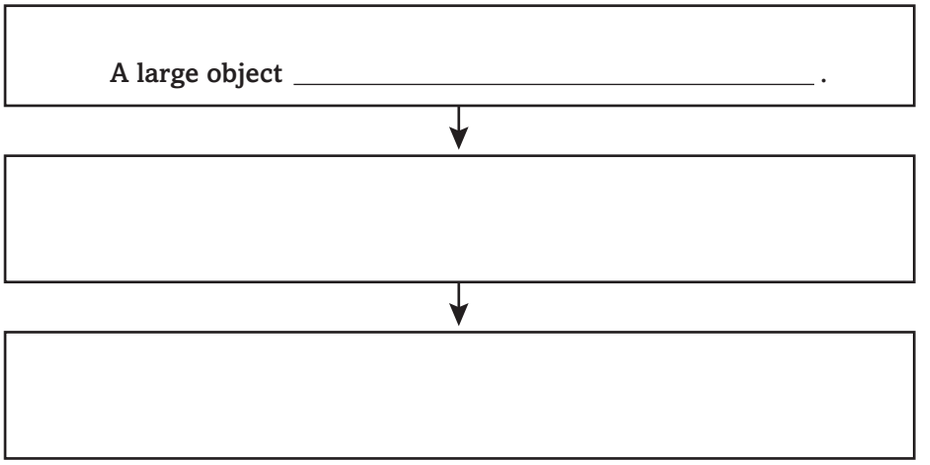
Name _____ **Date** _____

Lesson 2 The Sun-Earth-Moon System (continued)

Main Idea	Details
Earth's Motion Around the Sun *I found this information on page _____.*	**Organize** *information about* Earth's orbit around the Sun. *Complete the concept map.* 
I found this information on page _____.	**Complete** *the statements below to describe* Earth's rotation. Earth completes a rotation in about _____. Its axis is tilted at an angle of _____ to _____.
The Moon—Earth's Satellite *I found this information on page _____.*	**Sequence** *the events that led to the* formation of the Moon, *according to the present theory.* 

SUMMARIZE IT

Summarize three main ideas from the above sections.

_____

_____

_____

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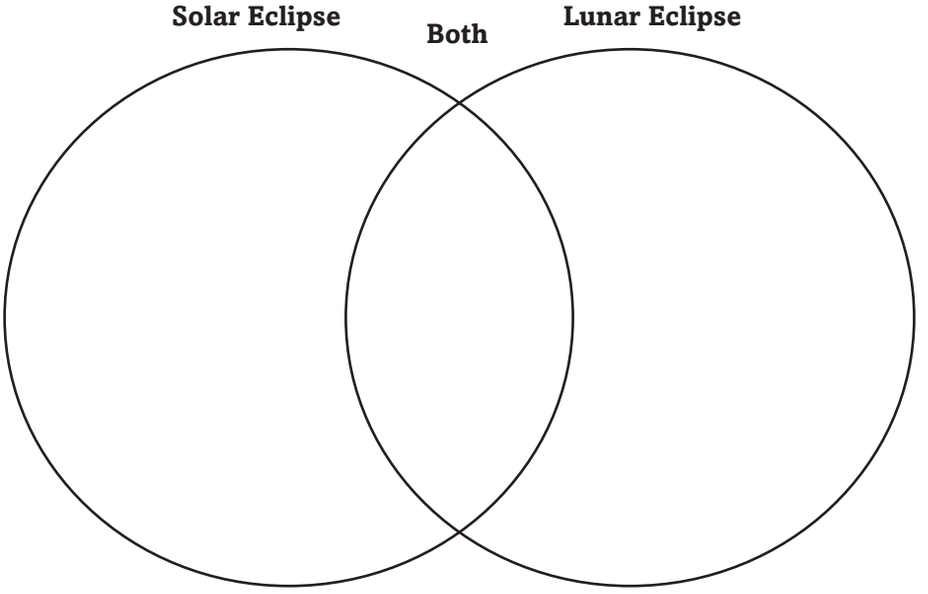
Name _____ **Date** _____

Main Idea	Details
The Moon—Earth's Satellite *I found this information on page _____.*	**Create** *a diagram showing the* phases of the Moon. *Include* Earth *and the* direction of sunlight. *Label each phase.*
Eclipses *I found this information on page _____.*	**Compare and contrast** *a* solar eclipse *and a* lunar eclipse. *Complete the Venn diagram with at least six facts.*



SUMMARIZE IT

Choose one main idea from each of the above sections. Rephrase these ideas in your own words.

_____

_____

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Name _____ **Date** _____

Our Solar System

Lesson 3 The Planets and Their Moons

Grade 8 Science Content Standards—4.e: Students know the appearance, general composition, relative position and size, and motion of objects in the solar system, including planets, planetary satellites, comets, and asteroids. Also covers: 4.d

Skim *Lesson 3. Write three ideas you discover as you skim the lesson.*

1. _____

_____

2. _____

_____

3. _____

_____

Review Vocabulary

Define atmospheric pressure *using its scientific meaning.*

atmospheric pressure _____

_____

New Vocabulary

Use your book or dictionary to define the following terms. Then use each term in a sentence that shows its scientific meaning.

inner planet _____

_____

outer planet _____

_____

Academic Vocabulary

Use a dictionary to define vehicle.

vehicle _____

_____

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Name _____ **Date** _____

Lesson 3 The Planets and Their Moons (continued)

Main Idea

Details

The Inner Planets

I found this information on page _____.

Summarize *key facts about* Mercury.

Diameter: _____

Distance from Sun: _____

Temperature: _____

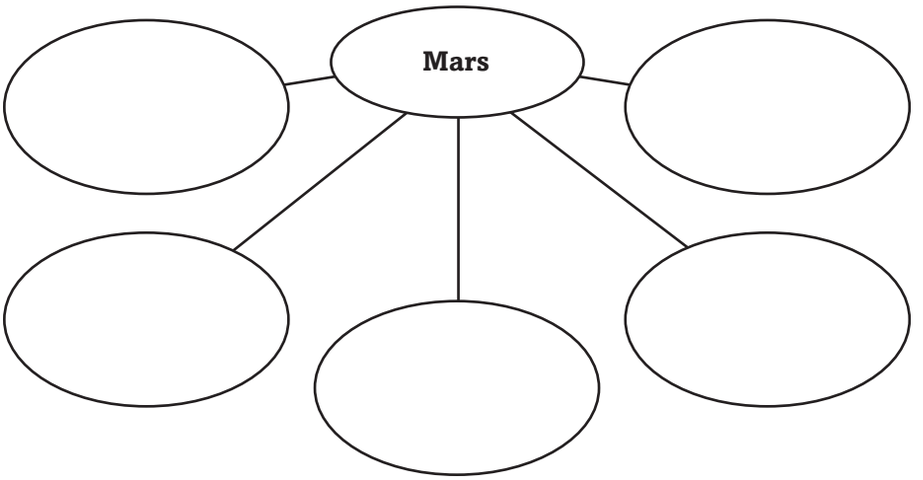
I found this information on page _____.

Compare and contrast Venus *and* Earth. *Complete the table.*

	Venus	Earth
Atmosphere		
Period of Rotation		
Period of Revolution		

I found this information on page _____.

Organize *information about* Mars. *Complete the concept map.*



Summarize It

Summarize one main idea about each inner planet.

_____

_____

_____

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Lesson 3 The Planets and Their Moons (continued)

Main Idea

Details

The Outer Planets

I found this information on page _____.

Distinguish *the 4* Galilean satellites of Jupiter. *Write one fact about each satellite.*

_____

_____

_____

I found this information on page _____.

Create *a graphic organizer of key information about* Saturn.

I found this information on page _____.

Organize *facts about* Uranus *and* Neptune. *Complete the table.*

	Uranus	Neptune
Atmosphere		
Known Moons		

Summarize It

Summarize two main ideas from the above section.

_____

_____

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Our Solar System

Lesson 4 Asteroids, Comets, and Meteroids

Grade 8 Science Content Standards—4.e: Students know the appearance, general composition, relative position and size, and motion of objects in the solar system, including planets, planetary satellites, comets, and asteroids.

Predict *three topics that will be covered in Lesson 4. Use the section headings to help.*

1. _____
2. _____
3. _____

Review Vocabulary

Define erosion *using your book or a dictionary.*

erosion _____

_____

New Vocabulary

Use your book or a dictionary to define each term.

asteroid _____

_____

comet _____

_____

meteoroid _____

_____

Academic Vocabulary

Use a dictionary to define impact. *Then use it in a sentence to reflect its scientific meaning.*

impact _____

_____

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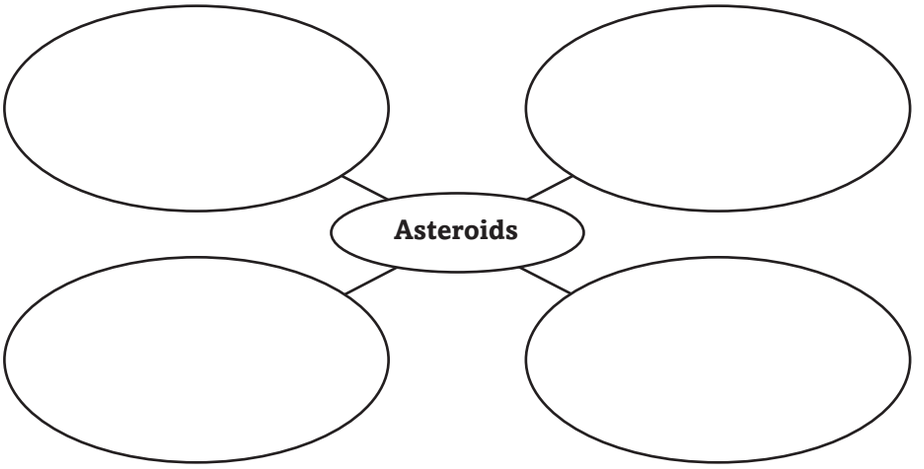
Lesson 4 Asteroids, Comets, and Meteroids (continued)

Main Idea	Details
Asteroids *I found this information on page* _____.	**Organize** *information about* asteroids. *Complete the concept map.*



Comets *I found this information on page* _____.	**Model** the parts of a comet. *Draw a comet as it travels away from the Sun. Use the words below to label your drawing.* coma nucleus dust tail ion tail

Summarize *the* discoveries made by *Deep Impact.*

_____

_____

_____

Summarize It

Rephrase the main ideas of the above sections.

_____

_____

_____

_____

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Lesson 4 Asteroids, Comets, and Meteoroids (continued)

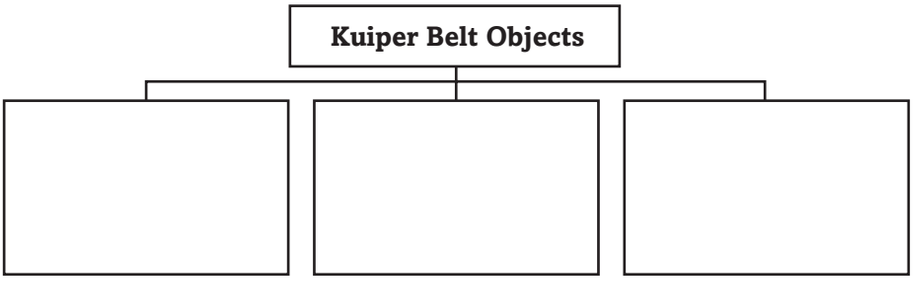
Main Idea

Details

Comets

I found this information on page _____.

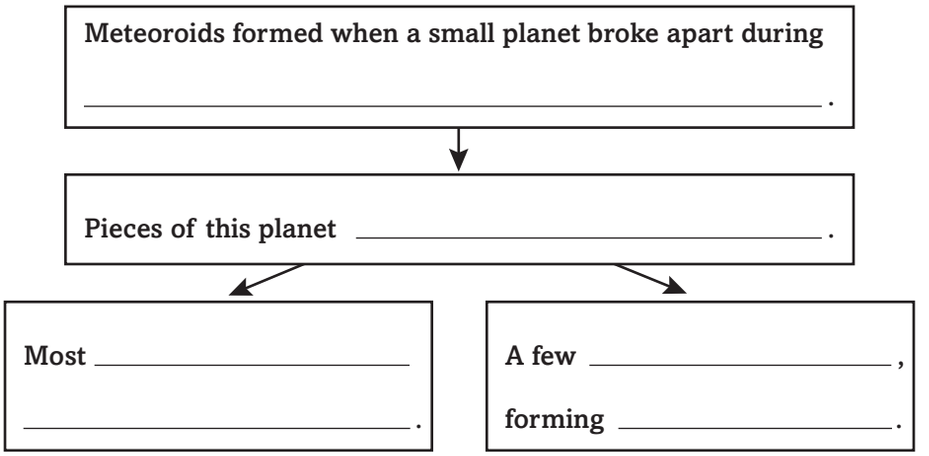
Complete *the concept map about* Kuiper Belt objects.



Meteoroids

I found this information on page _____.

Sequence *the formation of* meteoroids *and what happens when they reach Earth. Complete the flow chart.*



Summarize It

Use three bullet points to summarize the main ideas of the above sections.

_____

_____

_____

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Our Solar System Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column.

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After reading this chapter, write four sentences summarizing its main ideas.**

_____

_____

_____

_____

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Stars and Galaxies

Grade 8 Science Content Standards—4.b: Students know that the Sun is one of many stars in the Milky Way galaxy and that stars may differ in size, temperature, and color. Also covers: 2.g, 4.a, 4.c, 4.d

Before You Read

Before you read the chapter, think about what you already know about the topic. List three things that you already know about stars and galaxies in the first column. Then list three things that you would like to learn about stars and galaxies in the second column.

K What I know	W What I want to find out

Construct the Foldable as directed at the beginning of this chapter.

Science Journal

Write a short paragraph describing where you think stars are located relative to the solar system.

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Stars and Galaxies

Lesson 1 Stars

Grade 8 Science Content Standards—4.b: Students know that the Sun is one of many stars in the Milky Way galaxy and that stars may differ in size, temperature, and color. Also covers: 4.c, 4.d

Predict *three topics that will be discussed in Lesson 1 as you scan the headings and illustrations.*

1. _____
2. _____
3. _____

Review Vocabulary

Use your book to define spectral line.

spectral line _____

_____

New Vocabulary

Use your book to define the following terms. Then write an original sentence that contains each term.

light-year _____

_____

luminosity _____

_____

apparent magnitude _____

_____

absolute magnitude _____

_____

Academic Vocabulary

Use a dictionary to define element. *Then use it in a sentence to show its scientific meaning.*

element _____

_____

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Lesson 1 Stars (continued)

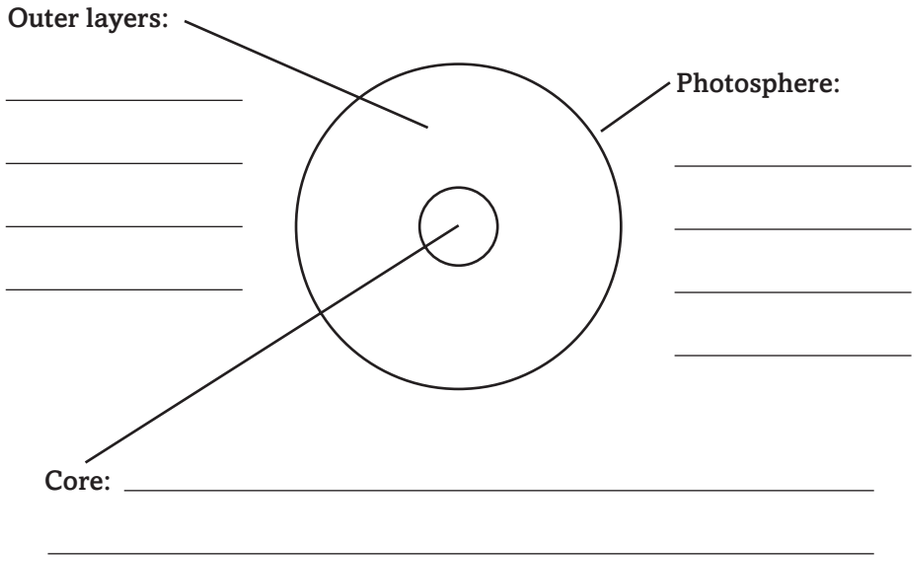
Main Idea

Details

What are stars?

I found this information on page _____.

Distinguish *between the layers of a star by describing each one.*



I found this information on page _____.

Compare *the light-year with other units.*

One light-year is about equal to _____ kilometers

One light-year is about equal to _____ AU

What are stars made of?

I found this information on page _____.

Define *the two types of spectra listed below.*

Continuous spectrum: _____

Absorption spectrum: _____

Summarize It

Summarize the three main ideas of the above sections with three bullet points.

_____

_____

_____

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Lesson 1 Stars (continued)

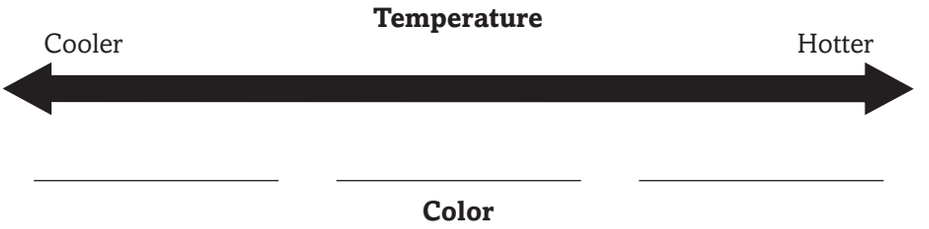
Main Idea

Details

Temperature and Color of Stars

I found this information on page _____.

Sequence *the colors of stars by temperature.*



The Brightness of Stars

I found this information on page _____.

Compare *the two ways of measuring magnitude by completing the diagram to show the relationship of each type of magnitude to a star's distance from Earth.*

Apparent magnitude _____	Absolute magnitude _____
_____	_____
_____	_____
_____.	_____.

Classifying Stars—The H-R Diagram

I found this information on page _____.

Classify *the different types of stars on the Hertzsprung-Russell diagram by completing the table below.*

Type of Star	Description
Main sequence	
Red giant	
Supergiant	
White dwarf	

Summarize It

Summarize two main ideas of the above sections.

_____

_____

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Stars and Galaxies

Lesson 2 How Stars Shine

Grade 8 Science Content Standards—2.g: Students know the role of gravity in forming and maintaining the shapes of planets, stars, and the solar system. Also covers: 4.d

Skim *through Lesson 2 of your book. Write three questions that come to mind from reading the headings and examining the illustrations.*

1. _____
2. _____
3. _____

Review Vocabulary

Use your book or a dictionary to define pressure.

pressure _____

New Vocabulary

Use your book to define the following terms.

nebula _____

nuclear fusion _____

red giant _____

white dwarf _____

supernova _____

neutron star _____

black hole _____

Academic Vocabulary

Use a dictionary to define contract. *Then use it in a sentence to show its scientific meaning.*

contract _____

_____

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Lesson 2 How Stars Shine (continued)

Main Idea	Details
How Stars Form *I found this information on page _____.*	**Sequence** *the steps involved in the formation of a protostar.* **1.** A nebula contains _____ of high density. **2.** _____ causes particles to clump together. **3.** The mass _____ causing temperature to _____. **4.** The mass becomes _____. **5.** A _____ is born.
How Stars Produce Light *I found this information on page _____.*	**Model** *the steps involved in a* nuclear fusion *reaction that leads to a star's producing visible light. Sketch and label the steps.*
I found this information on page _____.	**Analyze** *how the forces of pressure and gravity act on a star.*

SUMMARIZE IT **Summarize the three main ideas of the above sections of this lesson with three bullet points.**

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Name _____ **Date** _____

Main Idea

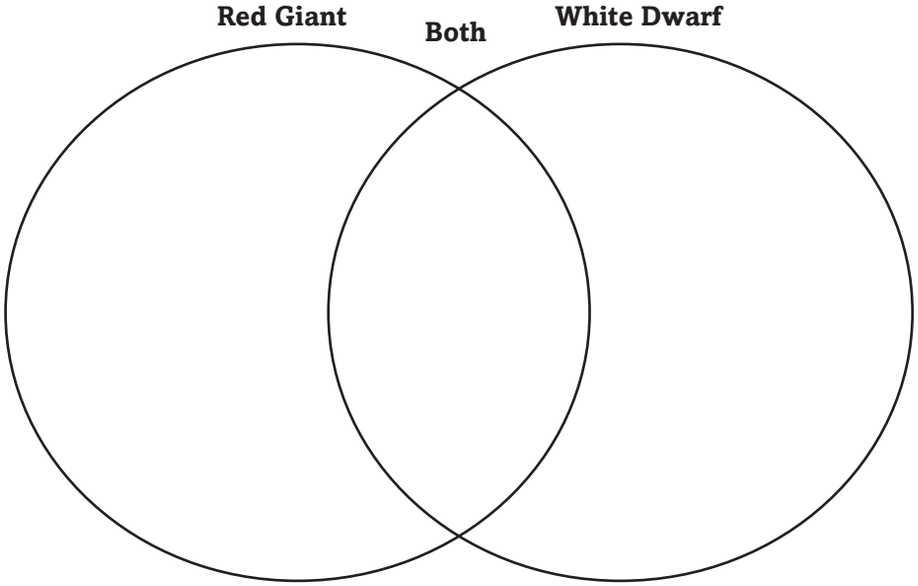
How Stars Come to an End

I found this information on page _____.

I found this information on page _____.

Details

Compare *and* contrast *the formation of a* red giant *with that of a* white dwarf. *Include at least six facts in the Venn diagram.*



Organize *information about* neutron stars *and* black holes *by filling in the blanks.*

Neutron stars are made of _____ _____. The stars are very _____ but very _____. They form when _____ and _____ fuse to form _____ in the core of a _____. If a neutron star has a great enough mass, gravitational forces may be so strong that _____ cannot escape. This is called a _____.

Summarize It

Highlight the main idea of this section in this passage.

When fusion stops within a star, there is no longer a balance between the forces of pressure and gravity. A star can collapse under the force of gravity. This can result in the formation of a white dwarf, a supernova, a neutron star, or a black hole.

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Stars and Galaxies

Lesson 3 Galaxies

Grade 8 Science Content Standards—4.a. Students know galaxies are clusters of billions of stars and may have different shapes. Also covers: 4.b, 4.c

Preview *Lesson 3 of your book. Use the checklist below.*

- ☐ Read all of the headings.
- ☐ Read all of the boldface words.
- ☐ Look at the illustrations.
- ☐ Think about what you already know about galaxies.

Write two facts that you discovered during your preview.

1. _____

2. _____

Review Vocabulary

Define ellipse *using your book or a dictionary.*

ellipse _____

New Vocabulary

Read the definition below. Write the correct vocabulary term on the blank to the left.

_____ theory that the universe began 14 billion years ago as a tiny point that expanded at great speed

Academic Vocabulary

Use a dictionary to define **randomly**.

randomly _____

_____

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Lesson 3 Stars and Galaxies (continued)

Main Idea

Stars Cluster in Galaxies and Types of Galaxies

I found this information on page _____.

I found this information on page _____.

Details

Classify *the three major types of galaxies. Complete the table.*

Galaxy Type	Description
Spiral galaxy	
Elliptical galaxy	
Irregular galaxy	

Model *the Milky Way galaxy as it would appear if viewed from above. Indicate where the solar system lies within the galaxy.*

Summarize It

Summarize the main ideas of the above sections with two bullet points.

_____

_____

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Main Idea

Details

The Distances Between Galaxies

I found this information on page _____.

Distinguish *between* galaxies, clusters, *and* superclusters *by completing the sentences.*

Galaxies

Galaxies are so far away that to the unaided eye the closest ones appear as _____. The closest galaxies to Earth are about _____.

are part of

Clusters

Galaxies are not _____ throughout the universe.

Our galaxy is part of a cluster of galaxies called _____.

are part of

Superclusters

A supercluster can spread across _____ light-years.

The Big Bang Theory

I found this information on page _____.

Summarize *the* big bang theory.

_____

_____

_____

_____

_____

_____

SUMMARIZE IT

Summarize the two main ideas of the above sections with two bullet points.

_____

_____

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Tie It Together

Synthesize It

Construct a concept map that includes the following terms: clusters, stars, white dwarfs, galaxies, red giants, superclusters, main sequence stars, and universe. Construct the concept map so that it shows the relationship between the terms from the most inclusive to the least inclusive. Include key information for each of the terms in your map.

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Stars and Galaxies Chapter Wrap-Up

Review the ideas you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column.

K What I know	W What I want to find out	L What I learned

Review

Use this checklist to help you study.

- ☐ Review the information you included in your Foldable.
- ☐ Study your *Science Notebook* on this chapter.
- ☐ Study the definitions of vocabulary words.
- ☐ Review daily homework assignments.
- ☐ Re-read the chapter and review the charts, graphs, and illustrations.
- ☐ Review the Standards Check at the end of each lesson.
- ☐ Look over the Standards Review at the end of the chapter.

SUMMARIZE IT **After studying the chapter, list three important things you have learned about stars and galaxies.**

_____

_____

_____

_____

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