About the Consultant

Douglas Fisher, Ph.D., is a Professor in the Department of Teacher Education at San Diego State University. He is the recipient of an International Reading Association Celebrate Literacy Award as well as a Christa McAuliffe award for Excellence in Teacher Education. He has published numerous articles on reading and literacy, differentiated instruction, and curriculum design as well as books, such as *Improving Adolescent Literacy: Strategies at Work* and *Responsive Curriculum Design in Secondary Schools: Meeting the Diverse Needs of Students*. He has taught a variety of courses in SDSU’s teacher-credentialing program as well as graduate-level courses on English language development and literacy. He also has taught classes in English, writing, and literacy development to secondary school students.
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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.

<table>
<thead>
<tr>
<th>Word or Phrase</th>
<th>Symbol or Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>for example</td>
<td>e.g.</td>
</tr>
<tr>
<td>such as</td>
<td>i.e.</td>
</tr>
<tr>
<td>with</td>
<td>w/</td>
</tr>
<tr>
<td>without</td>
<td>w/o</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Word or Phrase</th>
<th>Symbol or Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>and</td>
<td>+</td>
</tr>
<tr>
<td>approximately</td>
<td>≈</td>
</tr>
<tr>
<td>therefore</td>
<td>.∴</td>
</tr>
<tr>
<td>versus</td>
<td>vs</td>
</tr>
</tbody>
</table>

• 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.
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.

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

**Academic Vocabulary**

- **cycle**: a complete set of events or phenomena recurring in the same sequence
- **define**: clear, without a doubt
- **displace**: to force to move from an original place
- **distribute**: to divide among several or many
- **eliminate**: to get rid of
- **enable**: to make possible
- **enormous**: very large
- **avoid**: to wear away
- **enumerate**: to determine the approximate value of something
- **expand**: to get bigger
- **export**: person who is very skillful or highly trained and informed in some special field
- **facilitate**: to make easy or easier
- **factor**: a substance that functions in a body system
- **feature**: a separate or special part or quality
- **flexible**: able to bend without breaking
- **hypothesis**: something that is suggested as being true for the purposes of argument or of further investigation
- **image**: a picture produced by an optical or electronic device
- **individual**: being or characteristic of a single thing
- **infer**: to arrive at a conclusion or an opinion by reasoning

**Vocabulary Development**
Vocabulary words help you to better understand your science lessons. Learning the Academic Glossary can help you score higher on standardized tests.
Section 1 Cell Division and Mitosis (continued)

**Main Idea**

Why is cell division important?

I found this information on page ____________

**Details**

Identify the three reasons cell division is important.

1. _______________________________________________________________________
2. _______________________________________________________________________
3. _______________________________________________________________________

The Cell Cycle

I found this information on page ____________

Sequence the steps of mitosis, and write a short description of what takes place in each phase.

1. _______________________________________________________________________
2. _______________________________________________________________________
3. _______________________________________________________________________

Mitosis

I found this information on page ____________

Summarize information about interphase in eukaryotic cells in the following paragraph.

Interphase is the ____________ part of the cell cycle. During interphase, cells ____________ and ____________. During interphase, cells that are still dividing copy their ____________ and prepare for _____________. Cells no longer dividing are ____________.

Cell Reproduction

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 ____________

Section 2 Sexual Reproduction and Meiosis (continued)

**Main Idea**

Sexual Reproduction

I found this information on page ____________

Compare characteristics of human diploid and haploid cells in the table below. Give examples of each type of cell.

<table>
<thead>
<tr>
<th>Types of Human Cells</th>
<th>Diploid</th>
<th>Haploid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of chromosomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process that produces them</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Meiosis and Sex Cells

I found this information on page ____________

Model the four stages of meiosis I in the spaces below. Use the figure in your book to help you.

<table>
<thead>
<tr>
<th>Meiosis I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prophase I</td>
</tr>
<tr>
<td>Anaphase I</td>
</tr>
</tbody>
</table>

Note-Taking Based on the Cornell Two-Column Format

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

Review Checklist

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

**SUMMARIZE IT**

List three important ideas from this chapter.

1. __________________________
2. __________________________
3. __________________________

**Cell Reproduction After You Read**

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

- One-celled organisms reproduce through cell division.
- Every living organism has a life cycle.
- All organisms reproduce sexually.
- Most of the cells formed in your body do not contain genetic material.

**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.
- Revise daily homework assignments.
- Review the self-check at the end of each section.
- Review the Chapter Review.
- Look over the Chapter Review.

**Science Level Green**

vii
The Nature of Science

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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>The Nature of Science</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Scientific methods are step-by-step procedures for solving problems.</td>
</tr>
<tr>
<td></td>
<td>• Scientists work only in laboratories.</td>
</tr>
<tr>
<td></td>
<td>• The last step in finding a scientific solution is to recognize a problem.</td>
</tr>
<tr>
<td></td>
<td>• An independent variable is a factor in an experiment that is changed by the investigator.</td>
</tr>
</tbody>
</table>

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

Science Journal

Write about a human artifact you know of that was discovered in an area near your home, or that was unearthed in another region.
The Nature of Science
Section 1 How Science Works

Skim Section 1 of your book. Read the headings and look at the illustrations. Write three questions that come to mind.

1. ______________________________________________________________________
2. ______________________________________________________________________
3. ______________________________________________________________________

Review Vocabulary Define the following term using your book or a dictionary.

artifact

New Vocabulary Use your book to define the following terms.

science

technology

Academic Vocabulary Use your book or dictionary to define the following term.

expert
Main Idea

Groundbreaking News

I found this information on page _________.

Details

Classify objects that archaeologists study as artifacts. Identify what an artifact is, and then complete the concept map.

Artifacts, or

Contrast the two branches of archaeology. Complete the diagram.

Archaeology

[Blank]  [Blank]
Summarize technology and how it is used in archaeology.

<table>
<thead>
<tr>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
</tr>
<tr>
<td>Examples:</td>
</tr>
<tr>
<td>Uses in Archaeology:</td>
</tr>
</tbody>
</table>

**Sequence** steps used by archaeologists to remove and study artifacts from a site.

1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________
6. ____________________________
7. ____________________________

**CONNECT IT**
Describe why the study of past cultures is important.
The Nature of Science
Section 2 Scientific Problem Solving

Predict  Read the title of Section 2 and make three predictions about what might be discussed in this section.

1. 
2. 
3. 

Review Vocabulary  Write a sentence using the word analyze.

analyze

New Vocabulary  Define Read the definitions below. Write the term on the blank in the left column.

classroom about an observation
factor or outcome that will be measured in an experiment
factor in an experiment that stays the same
step-by-step procedures of scientific problem solving
statement that can be tested
information that you gather with your senses
factor that you change in an experiment
standard used for comparison

Academic Vocabulary  Use your book or a dictionary to define project as a noun and as a verb.

project
**Main Idea**

**Scientific Methods**

I found this information on page __________.

**Details**

Complete the list of nine steps that might be used to solve a problem scientifically. Use the headings in the section to help you.

<table>
<thead>
<tr>
<th>Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Recognize the problem</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
</tr>
<tr>
<td>7.</td>
</tr>
<tr>
<td>8.</td>
</tr>
<tr>
<td>9.</td>
</tr>
</tbody>
</table>

Organize information about the first steps in the scientific method described in your book. Complete the concept maps.

Recognize the problem

Observe

Infer

Complete the description of a hypothesis. Fill in the missing words.

A hypothesis is a statement that can be _______________. It is based on ________________, ________________, and ________________.
You are a medical researcher, testing a new drug to treat asthma. State why it is important to repeat your experiments.
The Nature of Science  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 with these.

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

<table>
<thead>
<tr>
<th>The Nature of Science</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Scientific methods are step-by-step procedures for solving problems.</td>
<td></td>
</tr>
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<td></td>
</tr>
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</table>

Review

Use this checklist to help you study.

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☐ 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 Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three main ideas that you have learned about the nature of science.

__________________________________________________________
__________________________________________________________
__________________________________________________________

The Nature of Science  Chapter Wrap-Up
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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Minerals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Atoms in a mineral are arranged in an orderly pattern.</td>
</tr>
<tr>
<td></td>
<td>• Minerals are made in the lab from natural materials.</td>
</tr>
<tr>
<td></td>
<td>• Diamonds are so hard they cannot be broken.</td>
</tr>
<tr>
<td></td>
<td>• Minerals are a source of metals and other useful elements.</td>
</tr>
</tbody>
</table>

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

Write two questions that you would ask a gemologist—one who studies gems and gemstones—about the minerals that he or she works with.
Minerals
Section 1 Minerals

**Skim** through Section 1 of your book. Read the headings and examine the illustrations. Write three questions that come to mind.

1. 
2. 
3. 

**Review Vocabulary**

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

**atoms**

**New Vocabulary**

Use your book to define the following terms.

**mineral**

**crystal**

**magma**

**silicate**

**Academic Vocabulary**

Use a dictionary to define occur.

**occur**
Main Idea

What is a mineral?

I found this information on page ________.

The Structure of Minerals

I found this information on page ________.

Details

Organize the four characteristics shared by all minerals in the concept web below.

Model the structure of minerals by using simple geometric shapes or dot patterns to represent atoms arranged in a crystalline pattern.

Summarize how atoms are arranged in minerals.
Critique the statement “Coal is an essential mineral for society.”
Minerals
Section 2 Mineral Identification

Predict three things that you expect to learn based on the headings in Section 2.

1. 

2. 

3. 

Define physical property using your book or a dictionary.

physical property


New Vocabulary

Write the correct vocabulary term next to its definition.

measure of how easily a mineral can be scratched

describes the way a mineral reflects light from its surface; can be metallic or nonmetallic

color of a mineral when it is in powdered form

physical property of some minerals that causes them to break along smooth, flat surfaces

physical property of some minerals that causes them to break with uneven, rough, or jagged surfaces

Use a dictionary to define obvious.

obvious


Summarize why attempting to identify a mineral by its color alone may sometimes be deceiving.

Compare and contrast mineral hardness with the hardness of common objects by completing the diagram below.

**Mineral Hardness**

<table>
<thead>
<tr>
<th>Mohs Scale</th>
<th>Hardness</th>
<th>Common Objects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Talc (softest)</td>
<td></td>
<td>Piece of copper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Steel file</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diamond (hardest)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Analyze the chart by completing the prompts.

Your fingernail can scratch the minerals _________ and _________.
A streak plate is softer than the minerals _________, _________, and _________.

I found this information on page _________.

I found this information on page _________.

Name ___________________________ Date ____________

Section 2 Mineral Identification (continued)
Create a concept web that identifies six properties used to identify minerals.

**Physical Properties**

I found this information on page __________.

**Identify** the unique properties of lodestone and calcite.

<table>
<thead>
<tr>
<th>lodestone</th>
<th>calcite</th>
</tr>
</thead>
</table>

**CONNECT IT**

Suppose you were given an assignment to scratch your name into a piece of glass on a special name plate. Identify which of the following minerals you could use. Which would work best? Support your choices with reasons and examples.

diamond  gypsum  apatite  quartz
Minerals
Section 3 Uses of Minerals

**New Vocabulary**

**Academic Vocabulary**

**Review Vocabulary**

**Predict** three things that might be discussed in Section 3. Read the headings to help you make your predictions.

1. 
2. 
3. 

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

metal

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

**gem**

ore

**Use a dictionary to define accurate.**

accurate
Section 3 Uses of Minerals

Main Idea

Gems
I found this information on page _________.

Useful Elements in Minerals
I found this information on page _________.

Details

Summarize what distinguishes gems from common samples of minerals.

Complete the chart to list some gems and their uses.

<table>
<thead>
<tr>
<th>Gem</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in cutting tools</td>
</tr>
<tr>
<td>Rubies</td>
<td></td>
</tr>
<tr>
<td>Quartz crystals</td>
<td></td>
</tr>
</tbody>
</table>

Sequence the stages from ore, to refined element, to manufactured product.

<table>
<thead>
<tr>
<th>Ore</th>
<th>Element</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bauxite</td>
<td>iron</td>
<td>frying pans, nails</td>
</tr>
<tr>
<td>Ilmenite or rutile</td>
<td>zinc</td>
<td></td>
</tr>
</tbody>
</table>
Complete the flow chart to describe how vein minerals form.

Metallic elements dissolve in liquid.

Liquid forms mineral deposits called vein minerals.

SYNTHESIZE IT
Infer why aluminum is more expensive than iron or steel. Compare the availability of aluminum recycling to that of iron or steel. Explain your reasoning.
Tie It Together

Synthesize

Create a concept web to summarize what you have learned about mineral characteristics, composition, identification, and uses. (Hint: You may find it easier to write a list of facts to include, and then organize them into the web.)
Minerals 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 with these.

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

<table>
<thead>
<tr>
<th>Minerals</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
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<td>• Diamonds are so hard they cannot be broken.</td>
<td></td>
</tr>
<tr>
<td>• Minerals are a source of metals and other useful elements.</td>
<td></td>
</tr>
</tbody>
</table>

Review

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☐ 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 Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three things that you have learned about minerals.


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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Rocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Heat can melt rock.</td>
</tr>
<tr>
<td></td>
<td>• Rocks from lava form only under Earth’s surface.</td>
</tr>
<tr>
<td></td>
<td>• Rocks on Earth change slowly over time.</td>
</tr>
<tr>
<td></td>
<td>• Many rocks form in layers.</td>
</tr>
</tbody>
</table>

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

Are you a rock collector? If so, write two sentences about your favorite rock. If not, describe rocks that you have seen in enough detail that a non-sighted person could visualize them.
Rocks
Section 1 The Rock Cycle

**Skim** Section 1 of your book. Read the headings and examine the illustrations. Write three questions that come to mind.

1. 

2. 

3. 

**Review Vocabulary**

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

- mineral

**New Vocabulary**

Use your book to define the following terms. Then use each term in an original sentence to show its scientific meaning.

- rock

- rock cycle

**Academic Vocabulary**

Use your book or a dictionary to define erode.

- erode
Complete the blanks in this description of rock.

Most common rock contains one or more ________________ such as ________________ or ________________.

Rock types may also contain ________________,
_______________, or ________________.

Classify the three major types of rocks. Complete the graphic organizer.

Model the rock cycle. Draw a diagram showing the ways in which rock can change. Include the five types of rock and the processes through which they can change.
Main Idea

The Rock Cycle

Organize ways that each form of rock can change in the rock cycle. Complete the flowcharts.

Starting form | Process | Ending form
---|---|---
magma | | |
| | | |
| | | |
| | | |
igneous, sedimentary, or metamorphic rock | | |
| | | |
| | | |
sediment | | |
| | | |
| | | |

Details

In the rock cycle, matter is ______ lost or destroyed. It is ______ and used in other forms. Neither ______, weathering, nor ______ destroys matter.

Summarize It

Choose a form of rock. Then use the rock cycle diagram to describe all the possible ways that rock could form.

I found this information on page _________.

I found this information on page _________.

Section 1 The Rock Cycle (continued)
Rocks
Section 2  Igneous Rocks

Scan the headings of Section 2. Identify three categories of formation of igneous rocks and three classification groups.

1. ___________________, _______________, or ___________________
2. ___________________, _______________, or ___________________

Review Vocabulary

Explain how an element is different from a compound or a mixture.

element
_________________________________________________________
_________________________________________________________
_________________________________________________________

New Vocabulary

Use your book to define the following terms.

igneous rock
_________________________________________________________
_________________________________________________________
_________________________________________________________

lava
_________________________________________________________
_________________________________________________________
_________________________________________________________

intrusive
_________________________________________________________
_________________________________________________________
_________________________________________________________

extrusive
_________________________________________________________
_________________________________________________________
_________________________________________________________

Academic Vocabulary

Use your book or a dictionary to define infer. Then explain why inferring is important to scientists.

infer
_________________________________________________________
_________________________________________________________
_________________________________________________________
Complete the flow chart about lava.

1. ________________
2. ________________

Identify two sources of heat that melt rocks beneath Earth's surface.
1. ________________
2. ________________

Distinguish among the types of igneous rocks and the processes by which they form. Complete the chart.

<table>
<thead>
<tr>
<th>Type of Rock</th>
<th>Characteristics</th>
<th>Formation Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrusive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extrusive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volcanic Glass</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Main Idea**

**Classifying Igneous Rocks**

I found this information on page __________.

---

**Details**

**Sequence** the three types of igneous rock. The arrows show how the density, silica content, and iron and magnesium content increase among the types of igneous rock.

<table>
<thead>
<tr>
<th>Density</th>
<th>Silica</th>
<th>Iron and Magnesium</th>
</tr>
</thead>
</table>

**Analyze** how the characteristics of each type of magma affect how it rises to the surface.

<table>
<thead>
<tr>
<th>Type of Magma</th>
<th>Characteristics</th>
<th>How It Rises to the Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basaltic</td>
<td></td>
<td>oozes out through cracks in ocean floor or spills out of volcanos</td>
</tr>
<tr>
<td>Granitic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Andesitic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**SYNTHESIZE IT**

Classify the following rocks on the basis of what you have learned from this section. Identify whether each is intrusive or extrusive, and identify its composition as basaltic, granitic, or andesitic.

a) a dark-colored rock containing a high level of iron that formed from magma that cooled beneath Earth’s surface

b) a light-colored rock with high silica content that formed from lava on Earth’s surface
Rocks
Section 3 Metamorphic Rocks

Scan the headings in Section 3. Predict two subjects that you expect will be discussed in this section.

1. __________________________
   __________________________

2. __________________________
   __________________________

Review Vocabulary

Define pressure using your book or a dictionary. Then write a sentence that shows its scientific meaning.

pressure
   __________________________
   __________________________
   __________________________

New Vocabulary

Write the vocabulary term that matches each definition.

rock formed when heat, pressure, or fluids act on other rock to change its form, its composition, or both
   __________________________

describes metamorphic rock whose mineral grains line up in parallel layers
   __________________________

describes metamorphic rock whose mineral grains generally do not form layers
   __________________________

Academic Vocabulary

Use a dictionary to define transform.

transform
   __________________________
   __________________________
**Main Idea**

**Formation of Metamorphic Rocks**

*I found this information on page __________ .*

---

**Details**

**Organize** information about the processes that can form metamorphic rock.

- Heat and pressure change.

**Sequence** the types of rocks in the process from shale to gneiss.

- shale
- 
- 
- 
- gneiss

---

**Describe** the formation of foliated rock.

---

**Describe** the growth of grains in sandstone to change it to quartzite, a nonfoliated rock.

---
Main Idea

Classifying Metamorphic Rocks

I found this information on page _________.

Details

Summarize the two textures of metamorphic rocks. Describe each texture and give two examples of rocks with that texture.

Metamorphic Rock

Texture: ________________

Description: ________________

Examples: ________________

Texture: ________________

Description: ________________

Examples: ________________

SYNTHESIZE IT

A planner is designing a new office building. The building will have an open courtyard around it. Analyze what metamorphic rocks the planner might use. Explain why each rock would be useful.
Rocks
Section 4 Sedimentary Rocks

Skim Section 4. Write three questions you would like to answer. Find the answers to your questions as you read.

1. 

2. 

3. 

Define weathering using your book or a dictionary.
weathering

Write a sentence from Section 4 that uses each term.
sediments

sedimentary rock

compaction

cementation

Use a dictionary to define consist.
consist
Section 4 Sedimentary Rocks (continued)

**Main Idea**

**Formation of Sedimentary Rocks**

I found this information on page __________.

**Classifying Sedimentary Rocks**

I found this information on page __________.

**Detrital Sedimentary Rocks**

I found this information on page __________.

**Details**

Model the relative ages of sedimentary rock layers. Draw a cross-section of undisturbed sedimentary rocks. Label the oldest and youngest layers.

Identify and define the three types of sedimentary rock in the graphic organizer below.

Classify types of detrital sedimentary rock by the size and shape (where shape is relevant) of the particles found in them.

<table>
<thead>
<tr>
<th>Type</th>
<th>Conglomerate</th>
<th>Breccia</th>
<th>Sandstone</th>
<th>Shale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size/shape</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sketch of rock</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 4 Sedimentary Rocks (continued)

**Main Idea**

**Chemical Sedimentary Rocks**
I found this information on page __________.

**Organic Sedimentary Rocks**
I found this information on page __________.

**Details**

**Sequence** the steps in the formation of chemical sedimentary rocks. Complete the graphic organizer.

1. Minerals are dissolved in water.
2. 
3. 
4. 

**Identify** two examples of chemical sedimentary rocks.

Examples: ____________________________

**List** three organic sedimentary rocks and explain how each forms.

Rock: ____________________________
How It Forms: ____________________________
________________________________________

Rock: ____________________________
How It Forms: ____________________________
________________________________________

Rock: ____________________________
How It Forms: ____________________________
________________________________________

**CONNECT IT**
Describe at least four uses for sedimentary rocks in your life.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Rocks 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 with these.

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

<table>
<thead>
<tr>
<th>Rocks</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Heat can melt rock.</td>
<td></td>
</tr>
<tr>
<td>• Rocks from lava form only under Earth’s surface.</td>
<td></td>
</tr>
<tr>
<td>• Rocks on Earth change slowly over time.</td>
<td></td>
</tr>
<tr>
<td>• Many rocks form in layers.</td>
<td></td>
</tr>
</tbody>
</table>

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 Self Check at the end of each section.

☐ Look over the Chapter Review at the end of the chapter.

SYNTHESIZE IT

The rock cycle is said to have no beginning and no end. Discuss why this is true. Use an example to illustrate your answer.
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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Atmosphere</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Earth’s early atmosphere was produced by erupting volcanoes.</td>
</tr>
<tr>
<td></td>
<td>• Nitrogen makes up most of Earth’s atmosphere.</td>
</tr>
<tr>
<td></td>
<td>• Energy from the Moon causes winds and ocean currents.</td>
</tr>
<tr>
<td></td>
<td>• Wind is the movement of air from an area of higher pressure to an area of lower pressure.</td>
</tr>
</tbody>
</table>

- **Foldables** Study Organizer

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

- **Science Journal**

Write an article describing how you might prepare to climb Mt. Everest.

---

Name __________________ Date __________________
Skim the headings in Section 1. Then make three predictions about what you will learn.

1. 

2. 

3. 

Define pressure in a sentence that shows its scientific meaning.

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

atmosphere

ionosphere

ultraviolet radiation

chlorofluorocarbon

Use a dictionary to define trace in terms of a scientific amount.
**Summary**

Earth’s atmosphere is important to life on Earth because it provides the necessary conditions for life to exist. It protects life from harmful solar radiation, supports weather systems, and contains gases essential for plant and animal life.

**Compare**

The amount of gases in the atmosphere can be compared by rereading the section and analyzing the circle graph in your book. Then complete the following paragraph.

The gas that makes up most of the atmosphere is

_________ makes up 21 percent of the atmosphere. Oxygen gas is important because

__________________________  Although carbon dioxide makes up only 0.03% of the atmosphere it is a concern because

__________________________

**Model**

Model the layers of the atmosphere by drawing them below. Label and describe the characteristics of each layer.

---

**Main Idea**

**Importance of the Atmosphere**

*Importance of the Atmosphere*

I found this information on page ____________.

**Makeup of the Atmosphere**

*Makeup of the Atmosphere*

I found this information on page ____________.

**Layers of the Atmosphere**

*Layers of the Atmosphere*

I found this information on page ____________.
Main Idea

Atmospheric Pressure

Model how air pressure changes as you go higher in the atmosphere with dots representing air molecules. Describe the cause of air pressure.

Temperature in Atmospheric Layers

Compare the temperature changes that occur as you go higher in the troposphere, stratosphere, mesosphere, and thermosphere. Use the figure in your book to help you.

Connect It

Why did many governments around the world agree to ban the production and use of CFCs in the mid-1990s?
Atmosphere
Section 2 Energy Transfer in the Atmosphere

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

1. 
2. 
3. 

Use your book to define the term evaporation.

Write the correct key term next to each definition.

energy that is transferred in the form of rays or waves
transfer of energy that occurs when molecules bump into one another
transfer of heat by the flow of material
term that describes all of the water on Earth’s surface
process of water vapor changing to a liquid

Use a dictionary to define displace.
Main Idea

Energy from the Sun

Energy from the Sun

I found this information on page ___________.

Details

Analyze the figure in your book that shows what percent of the Sun’s energy is absorbed and reflected by Earth. Then, label the circle graph to represent the data.

Compare and contrast the three forms of energy transfer in the chart.

<table>
<thead>
<tr>
<th>Heat Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process</td>
</tr>
<tr>
<td>Radiation</td>
</tr>
<tr>
<td>Conduction</td>
</tr>
<tr>
<td>Convection</td>
</tr>
</tbody>
</table>

Describe the types of energy transfer that occur when you burn your bare feet when walking on hot sand.
Section 2 Energy Transfer in the Atmosphere (continued)

Main Idea

The Water Cycle

Create a flow chart to describe the water cycle.

Comparison

Earth’s Atmosphere is Unique

Compare Earth’s atmosphere to the atmospheres of Venus and Mars.

<table>
<thead>
<tr>
<th>Planet</th>
<th>Description of Atmosphere</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venus</td>
<td></td>
</tr>
<tr>
<td>Mars</td>
<td></td>
</tr>
<tr>
<td>Earth</td>
<td></td>
</tr>
</tbody>
</table>

Summarize It

Infer from your reading three ways in which the atmosphere allows for life on Earth.

1.

2.

3.
Atmosphere
Section 3 Air Movement

Scan Section 3 in your book. Then write three ways that moving air affects people.

1. ____________________________
2. ____________________________
3. ____________________________

Use density in a sentence that shows its scientific meaning.

density ____________________________
______________________________
______________________________

Use the following key terms in sentences that reflect their scientific meanings.

Coriolis effect ____________________________
______________________________
______________________________

jet stream ____________________________
______________________________
______________________________

sea breeze ____________________________
______________________________
______________________________

land breeze ____________________________
______________________________
______________________________

Define create using a dictionary.

create ____________________________
______________________________
______________________________
Main Idea

Forming Wind
I found this information on page __________.

Global Winds
I found this information on page __________.

Details

Sequence how heated air and the Coriolis effect form wind.

1. The equator receives __________________________
   __________________________

2. As a result, air near the equator is __________________________
   __________________________

3. Dense air moves from __________________________
   __________________________

4. The rotation of Earth causes __________________________
   __________________________

5. Thus, the Coriolis effect causes __________________________
   __________________________

Analyze the models of the surface winds and winds of the upper troposphere in your book. Then complete the following statements.

1. The equatorial doldrums are located at __________________________
   latitude.

2. __________________________ blow from the east in areas north and south of the equator.

3. __________________________ move weather systems across most of North America.

4. Most surface wind systems are named __________________________
   __________________________

5. The jet stream in the United States travels from __________________________
   __________________________

6. The jet stream travels at the border between __________________________
   __________________________
**Main Idea**

**Local Wind Systems**

I found this information on page _______.

**Details**

**Model** how air flows where the land meets the sea during the day and at night. Draw the two conditions below using arrows to indicate the direction of air flow.

<table>
<thead>
<tr>
<th>Day</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sequence** three steps that occurred in each of your drawings above.

<table>
<thead>
<tr>
<th>Day</th>
<th>Night</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
<td>3.</td>
</tr>
</tbody>
</table>

**Connect It**

Describe the role that the Sun’s energy has in creating wind.
Tie It Together

Model

Design a way to model how the curved surface of Earth affects how much direct sunlight the equator receives compared to the north pole. Discuss how you could test your model, and describe what you would hope to observe.

Materials might include: flashlight or lamp, a round object like a basketball, darkened room

1. 

2. 

Results:
Atmosphere  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 with these.

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<table>
<thead>
<tr>
<th>Atmosphere</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Earth’s early atmosphere was produced by erupting volcanoes.</td>
<td></td>
</tr>
<tr>
<td>• Nitrogen makes up most of Earth’s atmosphere.</td>
<td></td>
</tr>
<tr>
<td>• Energy from the Moon causes winds and ocean currents.</td>
<td></td>
</tr>
<tr>
<td>• Wind is the movement of air from an area of higher pressure to an area of lower pressure.</td>
<td></td>
</tr>
</tbody>
</table>

Review

Use this checklist to help you study.

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☐ 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 Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three main ideas that you have learned about Earth’s atmosphere.

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________
Weather

Before You Read

*Before you read the chapter, look at the headings throughout the chapter and complete the chart below.*

<table>
<thead>
<tr>
<th>What I know</th>
<th>What I want to find out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Foldables Study Organizer**

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

**Science Journal**

*Write three questions you would ask a meteorologist about weather.*

---

---
Scan the headings of the paragraphs throughout Section 1. Write a sentence about a topic that interests you.

Define each vocabulary term below.

**factor**

**weather**

**humidity**

**relative humidity**

**dew point**

**fog**

**precipitation**

Use a dictionary to define role.
Section 1  What is weather? (continued)

Main Idea

Weather Factors
I found this information on page __________.

Details

Organize information about factors that determine the weather by completing the concept map.

Factors that determine the weather

Contrast the characteristics of low and high air pressure.

<table>
<thead>
<tr>
<th>Air Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
</tr>
</tbody>
</table>

Dew Point
I found this information on page __________.

Summarize the relationship between the dew point and the amount of water vapor in the air.
Section 1 What is weather? (continued)

Main Idea

Forming Clouds
I found this information on page _________.

Details

Sequence the steps in cloud formation. The first step is filled in for you.

<table>
<thead>
<tr>
<th>Cloud Formation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Warm air is forced upward.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
</tbody>
</table>

Classifying Clouds
I found this information on page _________.

Complete the following concept map about clouds and cloud types.

<table>
<thead>
<tr>
<th>Types of Clouds</th>
</tr>
</thead>
<tbody>
<tr>
<td>stratus clouds</td>
</tr>
<tr>
<td>appear as</td>
</tr>
<tr>
<td>puffy, often with flat bases</td>
</tr>
<tr>
<td>at</td>
</tr>
<tr>
<td>cirrus clouds</td>
</tr>
<tr>
<td>appear</td>
</tr>
<tr>
<td>at</td>
</tr>
<tr>
<td>dark</td>
</tr>
<tr>
<td>appear</td>
</tr>
<tr>
<td>at</td>
</tr>
<tr>
<td>low to high altitudes</td>
</tr>
</tbody>
</table>

CONNECT IT
A bottle of water sitting on a picnic table has droplets of water covering it. Analyze what this tells you about the temperatures of the water bottle and the air around it.
Scan the headings throughout Section 2. Write three questions about the topics covered in the section.

1. 
2. 
3. 

Define barometer using your book or a dictionary.

barometer

Use your book or a dictionary to define each key term.

air mass

front

tornado

hurricane

blizzard

Use a dictionary to define the term accompany.

accompany
Classify the characteristics of air masses according to where they develop by completing the chart below.

<table>
<thead>
<tr>
<th></th>
<th>Tropics</th>
<th>Polar regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>warm, dry</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model the directions in which winds blow in high- and low-pressure systems of the northern hemisphere. Use arrows to draw the direction the winds move. Then describe the weather associated with each.

<table>
<thead>
<tr>
<th></th>
<th>Low-pressure Winds</th>
<th>High-pressure Winds</th>
</tr>
</thead>
</table>

Compare and describe the four types of fronts.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Main Idea

Severe Weather

I found this information on page __________.

Details

Organize the information on severe weather by completing the Venn diagram using the list of items below.

- May be accompanied by damaging hail
- Pose danger to people, structures, and animals
- Measured by the Fujita scale
- The most powerful type of storm

- Occurs in warm, moist air masses along fronts
- Violently rotating column of air in contact with ground
- Heavy rains can cause flooding
- Turns heat from ocean into wind

Thunderstorm

Hurricane

All

Tornado

CONNECT IT

Summarize what actions to take during severe weather.

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________
Weather
Section 3 Weather Forecasts

Scan the headings and look at the illustrations throughout Section 3. List four things you would like to learn about.

1. 
2. 
3. 
4. 

Review Vocabulary Write the correct vocabulary term next to each definition.

to predict a condition or event on the basis of observations

New Vocabulary

a scientist who studies weather and weather patterns in an effort to predict changing weather conditions

combination of symbols that meteorologists record on a map showing weather conditions at one specific location

line on a weather map drawn to connect locations of equal temperature

line on a weather map drawn to connect points of equal atmospheric pressure

Academic Vocabulary Define predict using a dictionary.

predict 

Name ____________________________________________ Date __________

54 Weather
Main Idea

Organize information about a meteorologist’s work. List five measurements that a meteorologist takes and four instruments that improve a meteorologist’s ability to predict weather.

Measurements
1. 
2. 
3. 
4. 
5. 

Instruments
1. 
2. 
3. 
4. 

Details

Forecasting Weather

Compare and contrast isobars and isotherms by completing the Venn diagram with at least one fact in each part of the diagram.
**Main Idea**

I found this information on page __________.

**Details**

**Summarize** information provided by the spacing of isobars on a weather map by completing the chart.

<table>
<thead>
<tr>
<th>Spacing of Isobars</th>
<th>What spacing indicates about atmospheric pressure</th>
<th>What spacing indicates about wind conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isobars close together</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isobars far apart</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Analyze** the information provided by the weather map in your book. Choose a city, and describe the weather it is experiencing.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

**CONNECT IT**

Evaluate the information you have learned in this chapter to predict whether forecasting the weather will become more accurate or less accurate in the coming years. Support your position with facts.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
You live in a region that sometimes is struck by hurricanes. Describe the plans that you would make to prepare for and respond to a hurricane.

Long-term planning for hurricane

When a hurricane has been predicted

Following a hurricane
Weather  Chapter Wrap-Up

Review the chart that you completed before you read the chapter. Then complete the chart below.

<table>
<thead>
<tr>
<th>What I learned</th>
<th>What I still want to find out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 Self Check at the end of each section.
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**SUMMARIZE IT**

After reading this chapter, identify three main ideas that you have learned about weather.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Climate

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.

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<th>Climate</th>
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</thead>
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<td></td>
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</tr>
<tr>
<td></td>
<td>• El Niño and La Niña are climatic events that can disrupt normal temperature and precipitation patterns around the world.</td>
</tr>
</tbody>
</table>

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

Science Journal

Write a paragraph explaining what you already know about the causes of seasons.
Climate
Section 1 What is climate?

Scan the Section 1 headings and illustrations. Formulate two questions about this section that come to mind.

1. __________________________________________________________________________
   __________________________________________________________________________

2. __________________________________________________________________________
   __________________________________________________________________________

Define the following key terms to show their scientific meanings.

latitude
   __________________________________________________________________________
   __________________________________________________________________________

climate
   __________________________________________________________________________
   __________________________________________________________________________

tropics
   __________________________________________________________________________
   __________________________________________________________________________

polar zone
   __________________________________________________________________________
   __________________________________________________________________________

temperate zone
   __________________________________________________________________________
   __________________________________________________________________________

minimum
   __________________________________________________________________________
   __________________________________________________________________________
Section 1 What is climate? (continued)

Main Idea

**Latitude and Climate**

*I found this information on page __________.*

Details

*Identify and label the climate zones on the globe below. Also include:*

- the equator
- Tropic of Cancer
- Tropic of Capricorn

*Organize factors that affect climate on the concept map below.*

COMPARE IT

Contrast the climate of Buffalo, New York, and Yuma, Arizona. Discuss the geographical features that affect the two climates.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Climate
Section 2 Climate Types

**Predict**  Read the title and the headings of Section 2. List three things that might be discussed in this section.

1. __________________________________________
2. __________________________________________
3. __________________________________________

**Review Vocabulary**  Define the following key terms. Use your book or a dictionary to help you.

- regions
- adaptation
- hibernation

**New Vocabulary**

- vary

**Classifying Climates**

I found this information on page ____________.

**Complete** the following paragraph about climates.

Wladimir Köppen developed a ______________________________

___________. He noticed that different types of ______________________________

_______________________________. He was able to relate _________

_______________________________.

Name _____________________________  Date ________________
**Main Idea**

**Classifying Climates**

I found this information on page ________.

**Details**

**Summarize** the six major climate zones shown in your book. Describe the important characteristics of each.

<table>
<thead>
<tr>
<th>World Climates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate Zone</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**SYNTHESIZE IT**

Analyze the two types of adaptations organisms have to climate. Discuss structural and behavioral adaptations, give an example of each, and then tell how both are similar.

---

---

---

---

---

---
Climate
Section 3 Climate Changes

Scan Use the checklist below to preview Section 3 of your book.

☐ Read all section titles.
☐ Read all bold words.
☐ Look at all pictures, charts, and graphs.
☐ Think about what you already know about climates.

Write three facts you discovered about climatic changes as you scanned the section.
1. 
2. 
3. 

Define solar radiation using a dictionary.

solar radiation

Write the correct vocabulary term next to each definition.

increase in the average world temperature of Earth
natural heating that occurs when certain gases in Earth’s atmosphere trap heat
climatic event that may occur when trade winds weaken or reverse, and can disrupt normal temperature and precipitation patterns around the world
destruction of woodlands that can result in increased atmospheric carbon dioxide levels
short period of climatic change caused by the tilt of Earth’s axis as Earth revolves around the Sun

Use a dictionary to find the scientific definition of reverse.
**Main Idea**

**Earth’s Seasons**

I found this information on page __________.

**Synthesize** information from your book to explain why the northern hemisphere has winter at the time when Earth is closest to the Sun.

---

**El Niño and La Niña**

I found this information on page __________.

**Contrast** conditions that occur during El Niño years with those that occur during La Niña years in the chart below.

<table>
<thead>
<tr>
<th>El Niño and La Niña</th>
<th>El Niño Year</th>
<th>La Niña Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength of trade winds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water temperature along west coast of South America</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical climate effects</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name ________________________ Date ____________

Section 3  Climate Changes (continued)
In the past, Earth’s overall climate has been and . During the last two million years, Earth’s climate has cycled between when glaciers advanced and when climate was similar to today’s climate.

Sequence events to explain how an erupting volcano can cause short-term climate change.

A volcano erupts adding small particles called aerosols to atmosphere. The particles block some sunlight from reaching Earth.

Complete the following chart about sunspots.

<table>
<thead>
<tr>
<th>Sunspots</th>
<th>Definition of sunspots</th>
<th>How sunspots affect climate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Period between 1645 and 1715</td>
<td>Safety warning</td>
</tr>
</tbody>
</table>
Main Idea

Climatic Changes Today

I found this information on page __________.

Global Warming and Human Activities and The Carbon Cycle

I found this information on page __________.

Sequence steps explaining the greenhouse effect. The first one has been done for you.

<table>
<thead>
<tr>
<th>The Greenhouse Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Radiation from the Sun strikes Earth’s surface.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
</tbody>
</table>

Analyze global warming by completing the concept map below.

Definition ____________________________

Global Warming

Related Human Activities Effect on carbon cycle

Synthesize It

Analyze how humans impact Earth’s atmosphere and how it may have long term effects on global climates.

__________________________

__________________________

__________________________

__________________________

__________________________

__________________________
Climate  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 with these.

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SUMMARIZE IT

After reading this chapter, identify three main ideas that you have learned about climate.
Earth in Space

Before You Read

Before you read the chapter, respond to these statements.

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</tr>
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<tbody>
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<td></td>
</tr>
<tr>
<td>• Observers on Earth always see the same side of the Moon.</td>
<td></td>
</tr>
<tr>
<td>• Most asteroids are about the same size as Earth.</td>
<td></td>
</tr>
<tr>
<td>• The solar system probably formed from a collapsing cloud of gas, ice, and dust.</td>
<td></td>
</tr>
</tbody>
</table>

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

Science Journal

Describe how our view of Earth has changed in the past 50 years.
Earth in Space
Section 1 Earth’s Motion and Seasons

Scan the illustrations in Section 1. Write three questions that come to mind about Earth’s motions. Look for answers to your questions as you read through the section.

1. 
2. 
3. 

Define equator. Then use the term in a sentence that shows its scientific meaning.

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

imaginary line around which Earth spins; drawn from Earth’s north geographic pole to its south geographic pole

time when the Sun reaches its greatest distance north or south of the equator
curved path followed by Earth as it moves around the Sun
motion of Earth around the Sun in about 365 \( \frac{1}{4} \) days, or one year
twice-yearly time when the Sun is directly above Earth’s equator
spinning of Earth on its axis which causes day and night

Use a dictionary to define sphere to show its scientific meaning.
Summarize key facts about Earth’s shape in the graphic organizer.

Model Earth’s shape, and then write a caption below your diagram.

Complete the paragraph below to explain why people on Earth experience day and night.

Earth rotates once ______________ around an imaginary line called ______________. As Earth rotates, each location on Earth will face toward the Sun and have ______________ and then face away from the Sun and have ______________.
Summarize factors that cause seasons. Complete the outline.

I. Earth’s Orbit
   A. ____________________________
   B. ____________________________
      1. ____________________________
      2. ____________________________

II. Earth’s Tilt
   A. ____________________________
   B. ____________________________
      1. ____________________________
      2. ____________________________

Draw a sketch of Earth’s orbit around the Sun. Label the solstices and equinoxes. Include their approximate dates.

| I found this information on page __________. |
| I found this information on page __________. |

Using the information that you have learned, write a short summary explaining why seasons occur.
Earth in Space
Section 2 Earth’s Moon

Predict three things that might be discussed in Section 2 after you have read its title and headings.
1. 
2. 
3. 

Define density to show its scientific meaning. Then give an example of one high-density material and one low-density material.

density

Use your book to define each vocabulary term.

moon phase

solar eclipse

lunar eclipse

Use the term cycle in a scientific sentence.
cycle
Section 2 Earth’s Moon (continued)

**Main Idea**

The Moon’s Surface and Interior

I found this information on page __________.

**Details**

Complete the graphic organizer with information about the Moon’s surface features.

- **Moon’s Surface Features**
  - maria
  - lunar highlands
  - craters

Model the Moon’s interior. Label each of the main layers of the Moon.

Motions of the Moon

I found this information on page __________.

Analyze the reason that the same side of the Moon always faces Earth.

---

Earth in Space
Main Idea

Motions of the Moon
I found this information on page _________.

Details

Label each Moon phase on the diagram below. Shade the Moon at each position to show the dark side.

Contrast solar and lunar eclipses. Complete the chart.

<table>
<thead>
<tr>
<th></th>
<th>Solar Eclipse</th>
<th>Lunar Eclipse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moon phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What happens</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarize four hypotheses about how the Moon formed. Place a star next to the most widely accepted hypothesis.

1. __________________________________________
2. __________________________________________
3. __________________________________________
4. __________________________________________

Origin of the Moon
I found this information on page _________.

Eclipses
I found this information on page _________.

Copyright © Glencoe/McGraw-Hill, a division of The McGraw-Hill Companies, Inc.
Skim Section 3. Write three things you think you will learn about the solar system.

1. 
2. 
3. 

Define atmosphere in a scientific sentence.

atmosphere

Use your book to define each vocabulary term.

solar system

astronomical unit

asteroid

nebula

Use a dictionary to define image as it is used in science.

image
Summarize key facts about the Sun and its role in the solar system.

The Sun contains ______________ of the matter in the solar system. It is a ______________ star that gives off ______________ amounts of light. The Sun is about ______________ km from Earth. This distance is also called 1 ______________, or ______________.

Contrast the inner and outer planets. Complete the chart.

<table>
<thead>
<tr>
<th>Location</th>
<th>Inner Planets</th>
<th>Outer Planets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composition</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Organize information about the inner planets. Complete the graphic organizer with at least three facts about each one.
Main Idea

Outer Planets

I found this information on page ___________.

Distinguish major characteristics of the outer planets. Complete the chart.

<table>
<thead>
<tr>
<th>Composition</th>
<th>Moons/Rings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jupiter</td>
<td>63 moons; Io is volcanic; Europa may have liquid water</td>
</tr>
<tr>
<td>Saturn</td>
<td></td>
</tr>
<tr>
<td>Uranus</td>
<td>hydrogen, helium, and methane; methane gives bluish-green color</td>
</tr>
<tr>
<td>Neptune</td>
<td>hydrogen, helium, and methane; faster winds than on any other planet</td>
</tr>
<tr>
<td>Pluto</td>
<td></td>
</tr>
</tbody>
</table>

Summarize important facts about asteroids and comets.

Asteroids are ______________ objects. Comets are made of ______________. As a comet approaches the Sun, it forms a ______________ as solar winds blow small particles ______________.

Origin of the Solar System

I found this information on page ___________.

Sequence the steps in the formation of the solar system.

1. ______________________________________________________________________
2. ______________________________________________________________________
3. ______________________________________________________________________
Tie It Together

Make a Scale Model

Make a scale model of the solar system’s planets.

Use the diameters in the chart to make your model. Set one planet’s scale diameter to calculate the others. Use math and ratios to figure out the size each planet should be on paper. For example, if Jupiter was to be 10 cm on your scale drawing,

\[
\frac{142,984 \text{ km}}{4,879 \text{ km}} = \frac{10 \text{ cm}}{x}
\]

\[
x = \frac{(4,789 \times 10)}{142,984} = 0.34 \text{ cm}
\]

Mercury would be 0.34 cm on the same drawing.

Label each planet in your model with one important fact about that planet.

<table>
<thead>
<tr>
<th>Planet</th>
<th>Diameter (km)</th>
<th>Scale diameter (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>4,879</td>
<td>0.34</td>
</tr>
<tr>
<td>Venus</td>
<td>12,104</td>
<td></td>
</tr>
<tr>
<td>Earth</td>
<td>12,756</td>
<td></td>
</tr>
<tr>
<td>Mars</td>
<td>6,794</td>
<td></td>
</tr>
<tr>
<td>Jupiter</td>
<td>142,984</td>
<td>10.0</td>
</tr>
<tr>
<td>Saturn</td>
<td>120,536</td>
<td></td>
</tr>
<tr>
<td>Uranus</td>
<td>51,118</td>
<td></td>
</tr>
<tr>
<td>Neptune</td>
<td>49,528</td>
<td></td>
</tr>
<tr>
<td>Pluto</td>
<td>2,390</td>
<td></td>
</tr>
</tbody>
</table>
Earth in Space  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 with these.

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SUMMARIZE IT

After reading this chapter, identify three main concepts that you have learned about the solar system.
Before You Read

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

<table>
<thead>
<tr>
<th>K</th>
<th>What I know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>W</th>
<th>What I want to find out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Science Journal

Make a list of the living things you might see in a forest.

____________________

____________________

____________________

____________________

____________________

____________________

____________________

____________________
Life’s Structure and Classification

Section 1 Living Things

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

1. __________________________________________
2. __________________________________________
3. __________________________________________

**Vocabulary**

**New Vocabulary**

Define *trait* using your book or a dictionary.

*trait* ________________________________

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

*organism* ________________________________

________________________________________

________________________________________

________________________________________

*cell* ________________________________

________________________________________

________________________________________

________________________________________

*homeostasis* ________________________________

________________________________________

________________________________________

________________________________________

**Academic Vocabulary**

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

*feature* ________________________________
Main Idea

What are living things like?

I found this information on page _______.

Create a graphic organizer about the cell in the space below.

Details

Analyze how organisms grow by completing the statements below.

1. A one-celled organism grows by __________________________

   ________________.

2. A many-celled organism grows by __________________________

   ________________.

Contrast the way plants get energy with the way animals get energy by completing the paragraph below.

Plants make food by using ________________ to combine ________________ and ________________. Plant cells then use this food as a source of ________________. Animals cannot use ________________ to make their own food. Animals must get the energy they need by ________________. The energy is then released in animal cells when food is combined with ________________. 
Summarize six features that all organisms have in common by completing the graphic organizer.

<table>
<thead>
<tr>
<th>are organized</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All organisms</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Identify three factors living things need to survive and an example of each.

1. __________________________
2. __________________________
3. __________________________

Describe how substances that make up living things are recycled.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Infer why you depend on the Sun for energy.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Life’s Structure and Classification

Section 2 How are living things classified?

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

1. __________________________________
2. __________________________________
3. __________________________________

Define hereditary using your book or a dictionary.

hereditary

Use your book to define the following terms.

binomial nomenclature

genus

phylogeny

kingdom

Use a dictionary to define category to show its scientific meaning.

category
Complete the graphic organizer below to identify the parts of a two-word scientific name.

 BINOMIAL NOMENCLATURE

First Word: ____________________  Second Word: ____________________

Summarize four reasons for using scientific names to classify organisms.

1. ____________________
2. ____________________
3. ____________________
4. ____________________

Organize the kinds of information modern scientists use to determine the phylogeny of a type of organism.

- Similarities in structure
- ____________________
- ____________________
- ____________________
- Used to determine phylogeny
Main Idea

Sequence today's classification system from the largest group to the smallest group.
1. __________________________
2. __________________________
3. __________________________
4. __________________________
5. __________________________
6. __________________________
7. __________________________

Identify the characteristics used in the dichotomous key to identify the different types of mice in North America.
1. __________________________
2. __________________________
3. __________________________
4. __________________________

Classify a mouse that has the following features: hair on tail, ears nearly hidden in fur, tail more than 25 mm long.

Common name: __________________________
Scientific name: __________________________

Tools for Identifying Organisms

I found this information on page ____________.

Synthesize It

Suggest at least three characteristics that could be used to identify your favorite type of pet.

Type of animal: __________________________
Characteristics: __________________________

I found this information on page ____________.
Life’s Structure and Classification
Section 3 Cell Structure

Scan the What You’ll Learn statements for Section 3 of your book. Identify four topics that will be discussed.

1. 
2. 
3. 
4. 

Define theory using your book or a dictionary.

theory

Use your book to define the following terms. Then provide an example of each.

tissue

organ

organ system

Use a dictionary to define rigid to show its scientific meaning.

rigid
Main Idea

**Viewing Cells and Development of Cell Theory**

I found this information on page ___________.

**Details**

Sequence the contributions that different scientists made toward the development of cell theory.

<table>
<thead>
<tr>
<th>Scientists</th>
<th>Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antonie van Leeuwenhoek</td>
<td>proposed that every cell came from a cell that already existed</td>
</tr>
</tbody>
</table>

Summarize cell theory by writing its three main points.

1. ______________________________________________________________________
2. ______________________________________________________________________
3. ______________________________________________________________________

Model a prokaryotic cell, and label its parts.
Model a eukaryotic cell and label its parts.

Organize the levels of cell organization from simplest to most complex.

1. 
2. 
3. 
4. 

Many-Celled Organisms

Compare and contrast the way single-celled organisms carry out life processes with the way many-celled organisms carry out life processes.
Review Vocabulary

Define bacteria using your book or a dictionary.

*bacteria*

New Vocabulary

Use your book to define the following terms. Then use both terms in a single sentence that shows the relationship between the terms.

*virus*

*host cell*

Academic Vocabulary

Use a dictionary to define substitute to show its scientific meaning.

*substitute*
### Main Idea

**What are viruses?**

*Identify* what a latent virus is and an example of one.

---

### Details

**Model** the process by which a virus multiplies and destroys the host cell.

<table>
<thead>
<tr>
<th>Drawing</th>
<th>Caption</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

*I found this information on page _________.*
Analyze why the potato leafroll virus can infect only a potato and not a human.

Organize the ways viral diseases can be prevented by completing the graphic organizer below.

Summarize how viruses are used in gene therapy.

List diseases caused by viruses that you have been vaccinated against.
Life’s Structure and Classification
Chapter Wrap-Up

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

<table>
<thead>
<tr>
<th>K</th>
<th>W</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>What I know</td>
<td>What I want to find out</td>
<td>What I learned</td>
</tr>
</tbody>
</table>

Review
Use this checklist to help you study.

☐ Review the information you included in your Foldable.
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☐ Study the definitions of vocabulary words.
☐ Review daily homework assignments.
☐ Re-read the chapter and review the charts, graphs, and illustrations.
☐ Review the Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

Summarize It
After reading this chapter, identify three main ideas you learned that you did not know before.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Cell Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Matter is made up of atoms.</td>
</tr>
<tr>
<td></td>
<td>• All substances chemically combine when they are mixed together.</td>
</tr>
<tr>
<td></td>
<td>• Energy is always needed to move material across a cell membrane.</td>
</tr>
<tr>
<td></td>
<td>• Plants can convert light energy into chemical energy.</td>
</tr>
</tbody>
</table>

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

Describe two ways in which you think plants get food and energy.

________________________________________________________

________________________________________________________

________________________________________________________

________________________________________________________

________________________________________________________

________________________________________________________
Cell Processes
Section 1 Chemistry of Life

Predict what you will learn in Section 1 after reading the headings and looking at the diagrams.

1. 
2. 
3. 

Define cell to show its scientific meaning.

cell 

Find each term in Section 1 and write the sentence where it is used.

mixture 

organic compound 

enzyme 

inorganic compound 

Use a dictionary to define bond as used in chemistry.

bond
Compare elements and compounds by completing the chart below.

<table>
<thead>
<tr>
<th></th>
<th>Elements</th>
<th>Compounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of types of atom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Example</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Classify each characteristic of compounds as ionic, molecular, or both.

_____________ has positively and negatively charged ions
_____________ share outermost electrons to bond
_____________ salt
_____________ sugar
_____________ involved in many life processes
_____________ have different properties than the elements from which they are made

Compare mixtures, solutions, and suspensions. Complete the statements below.

A mixture is ______________________________________

_______________________________________

Both solutions and suspensions ______________________________________

_______________________________________

In a solution, ______________________________________

_______________________________________

In a suspension, ______________________________________

_______________________________________
Summarize the functions of the four main organic compounds.

<table>
<thead>
<tr>
<th>Organic Compounds in Living Things</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compound</strong></td>
</tr>
<tr>
<td>Carbohydrates</td>
</tr>
<tr>
<td>Lipids</td>
</tr>
<tr>
<td>Proteins</td>
</tr>
<tr>
<td>Nucleic acids</td>
</tr>
</tbody>
</table>

Compare and contrast characteristics of organic and inorganic compounds by completing the table below.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Organic</th>
<th>Inorganic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains carbon?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role in living things</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Identify three ways that water is important to living things.

1. ____________________________________________

2. ____________________________________________

3. ____________________________________________
Cell Processes
Section 2 Moving Cellular Materials

**Skim** Section 2. List three headings you would use to make an outline of this section.

1. 
2. 
3. 

**Review Vocabulary**

Define cytoplasm to show its scientific meaning.

**New Vocabulary**

Write the vocabulary term that matches each definition.

movement of substances through a cell membrane without the use of energy

occurs when molecules of one substance are spread evenly throughout another substance

energy-requiring process in which transport proteins bind with particles and move them through a cell membrane

process by which a cell takes in a substance by surrounding it with the cell membrane

process by which vesicles release their contents outside the cell

type of passive transport in which molecules move from where there are more of them to where there are fewer of them

type of passive transport that occurs when water diffuses through a cell membrane

**Academic Vocabulary**

Use a dictionary to define the term facilitate.
Section 2 Moving Cellular Materials (continued)

Main Idea

Create a diagram that shows how oxygen diffuses from air sacs in the lungs to red blood cells.

Details

Write a short caption on how oxygen moves from the lungs to toe cells.

Complete the concept map of osmosis.

List three facts about facilitated diffusion.

1. 
2. 
3. 

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Sequence the process of how active transport moves materials into the cell.

1. 
2. 
3. 

Compare and contrast facilitated diffusion and active transport by writing yes or no in each box of the chart.

<table>
<thead>
<tr>
<th>Uses transport proteins?</th>
<th>Facilitated Diffusion</th>
<th>Active Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transports materials across cell membrane?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Requires energy?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Able to move materials from an area with less of the material to an area with more of the material?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Complete the table to identify the processes involved in moving very large particles in and out of cells.

<table>
<thead>
<tr>
<th>Process</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials entering cell</td>
<td></td>
</tr>
<tr>
<td>Materials being expelled from cell</td>
<td></td>
</tr>
</tbody>
</table>
Scan Section 3 of your book. Write three things you think you will learn about in this section.

1. __________________________________________

2. __________________________________________

3. __________________________________________

Define mitochondrion to show its scientific meaning.

mitochondrion

process by which producers and consumers release stored energy from food molecules

process by which oxygen-lacking cells and some one-celled organisms release small amounts of energy from glucose molecules and produce wastes such as alcohol, carbon dioxide, and lactic acid

process by which plants and many other producers use light energy to produce a simple sugar from carbon dioxide and water and give off oxygen

total of all chemical reactions in an organism

Use a dictionary to define obtain.
Model a chemical reaction in which an enzyme changes one large molecule into two smaller molecules.

Complete the table on the different materials and their roles in photosynthesis.

<table>
<thead>
<tr>
<th>Material</th>
<th>Role in Photosynthesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td></td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>products of photosynthesis</td>
</tr>
<tr>
<td>Chlorophyll</td>
<td></td>
</tr>
</tbody>
</table>

Analyze why photosynthesis is important to animals.

I found this information on page _________.

I found this information on page _________.

I found this information on page _________.

Name ___________________________________________ Date _____________

Section 3 Energy for Life (continued)
Summarize the process of respiration. State what is broken down and what the products are.

Compare fermentation with respiration.

<table>
<thead>
<tr>
<th>Process</th>
<th>Fermentation</th>
<th>Respiration</th>
</tr>
</thead>
<tbody>
<tr>
<td>What gets broken down?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where does breakdown occur?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is energy released?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What wastes are produced?</td>
<td>if insufficient O$_2$ in muscle cells:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>in yeast cells:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Describe the relationship between plants and animals. Use the listed terms in your description.

- carbon dioxide
- consumer
- energy
- oxygen
- photosynthesis
- producer
- respiration
Tie It Together

Synthesize

Suppose that you are small enough to be able to move around within the cytoplasm of a cell. Write a story about what it might be like to move through the cell membrane, including the method the cell would use to let you in. Explain why this is the best method.
Cell Processes  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 with these.

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

<table>
<thead>
<tr>
<th>Cell Processes</th>
<th>After You Read</th>
</tr>
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<tbody>
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</tr>
<tr>
<td>• Plants can convert light energy into chemical energy.</td>
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</tr>
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- [ ] Re-read the chapter and review the charts, graphs, and illustrations.
- [ ] Review the Self Check at the end of each section.
- [ ] Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

List three important ideas in this chapter.
Cell Reproduction

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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Cell Reproduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>• One-celled organisms reproduce through cell division.</td>
<td></td>
</tr>
<tr>
<td>• Every living organism has a life cycle.</td>
<td></td>
</tr>
<tr>
<td>• All organisms reproduce sexually.</td>
<td></td>
</tr>
<tr>
<td>• Most of the cells formed in your body do not contain genetic material.</td>
<td></td>
</tr>
</tbody>
</table>

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

Science Journal

Write three things that you know about how and why cells reproduce.
Skim Section 1 of your book. Read the headings, illustrations, and captions. Write three questions that come to mind as you skim the section.

1. 
2. 
3. 

Define nucleus to show its scientific meaning.

nucleus

Locate sentences in your book that use each of the following terms. Write each sentence here, and give the page on which you found it.

mitosis

chromosome

asexual reproduction

Use a dictionary to write a scientific definition of the term cycle. Then find a sentence in this section that defines the cell cycle, and write it here.

cycle
### Main Idea

**Why is cell division important?**

I found this information on page [ ]

---

### The Cell Cycle

I found this information on page [ ]

---

### Mitosis

I found this information on page [ ]

---

### Details

**Identify** the three reasons cell division is important.

1. 

2. 

3. 

---

**Summarize** information about interphase in eukaryotic cells in the following paragraph.

Interphase is the ________ part of the cell cycle. During interphase, cells ________ and _________. During interphase, cells that are still dividing copy their ________ and prepare for _________. Cells no longer dividing are ________.

---

**Sequence** the steps of mitosis, and write a short description of what takes place in each phase.

1. 

2. 

3. 

4. 

5. 

6. 

---
**Main Idea**

I found this information on page ____________.

**Details**

**Compare** mitosis in animals and plants. *State if each feature exists in** plant cells, animal cells, *or both.*

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cell Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrioles</td>
<td></td>
</tr>
<tr>
<td>Spindle fibers</td>
<td></td>
</tr>
<tr>
<td>Cell plate</td>
<td></td>
</tr>
<tr>
<td>Cell wall</td>
<td></td>
</tr>
</tbody>
</table>

**Organize** important concepts about mitosis.

1. Mitosis is the division of a ________________.

2. Mitosis produces two new nuclei that are identical both to ________________ and to ________________.

3. A nucleus with 46 chromosomes that undergoes mitosis will produce ________ nuclei, each with ________ chromosomes.

**Identify** the 3 forms of asexual reproduction described below.

__________ the method by which bacteria reproduce

__________ new organism growing from body of the parent

__________ to regrow body parts that are lost or damaged

---

**Connect It**

A strawberry farmer wants to increase her crop without spending large amounts of money for new seeds. How can she take advantage of asexual reproduction to increase her crop?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

110  Cell Reproduction
Skim the headings and illustrations in Section 2. Write three things you think you will learn about in this section.

1. 
2. 
3. 

Define organism to show its scientific meaning.

organism

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

in sexual reproduction, the joining of a sperm and egg

new diploid cell formed when a sperm fertilizes an egg; will divide by mitosis and develop into a new organism

sex cell formed in the female reproductive organs

cell whose similar chromosomes occur in pairs

reproductive process that produces haploid cells

haploid sex cell formed in the male reproductive organs

cells that have only half of each pair of chromosomes

type of reproduction in which two sex cells join to form a zygote

Use a dictionary to write a definition of similar.

similar
Main Idea

Sexual Reproduction

I found this information on page ________.

Compare characteristics of human diploid and haploid cells in the table below. Give examples of each type of cell.

<table>
<thead>
<tr>
<th>Types of Human Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Diploid</td>
</tr>
<tr>
<td>Haploid</td>
</tr>
<tr>
<td>Number of chromosomes</td>
</tr>
<tr>
<td>Process that produces them</td>
</tr>
<tr>
<td>Examples</td>
</tr>
</tbody>
</table>

Meiosis and Sex Cells

I found this information on page ________.

Model the four stages of meiosis I in the spaces below. Use the figure in your book to help you.

<table>
<thead>
<tr>
<th>Meiosis I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prophase I</td>
</tr>
<tr>
<td>Anaphase I</td>
</tr>
<tr>
<td>Metaphase I</td>
</tr>
<tr>
<td>Telophase I</td>
</tr>
</tbody>
</table>
Main Idea

I found this information on page ____________.

Details

Model what takes place inside a cell nucleus during meiosis II by drawing the four phases in the spaces below.

<table>
<thead>
<tr>
<th>Meiosis II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prophase II</td>
</tr>
<tr>
<td>Anaphase II</td>
</tr>
</tbody>
</table>

Summarize differences between meiosis I and meiosis II by writing a number, yes, or no in each box of the chart.

<table>
<thead>
<tr>
<th>Meiosis I</th>
<th>Meiosis II</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many cells result?</td>
<td></td>
</tr>
<tr>
<td>Is a haploid cell formed?</td>
<td></td>
</tr>
<tr>
<td>Do chromatids separate?</td>
<td></td>
</tr>
</tbody>
</table>

SYNTHESIZE IT

Fruit flies have eight chromosomes in their body cells. Mice have 40. How many chromosomes are there in each sex cell of these organisms?

______________________________________________________________________

______________________________________________________________________
Cell Reproduction
Section 3 DNA

Scan the list below to preview Section 3.

• Read all section titles.
• Read all bold words.
• Look at all illustrations and their labels.
• Think about what you already know about DNA.

Define heredity to show its scientific meaning.

Noun:
Verb:

Write the correct vocabulary term next to each definition.

deoxyribonucleic acid; a cell’s heredity material; made up of two strands, each consisting of a sugar-phosphate backbone and nitrogen bases: adenine, thymine, guanine, and cytosine

section of DNA that contains instructions for making specific proteins

ribonucleic acid; type of nucleic acid that contains the sugar ribose, phosphates, and bases adenine, guanine, cytosine, and uracil

any permanent change in a gene or chromosome of a cell; may be beneficial, harmful, or have little effect on an organism

The word code can be used as a noun or as a verb. Write a definition for its use as a noun and as a verb.

Noun:
Verb:
Main Idea

What is DNA?
I found this information on page __________.

I found this information on page __________.

Details

Identify the 4 nitrogen bases found in DNA.
1. __________________________
2. __________________________
3. __________________________
4. __________________________

Model a section of a DNA molecule, showing its twisted-ladder structure. Label the nitrogen bases, sugar, and phosphates. Make sure the nitrogen bases in your drawing are correctly paired.

Summarize how DNA copies itself.
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Complete the following paragraph on the relationship of proteins and genes.

Proteins are made up of long chains of __________________________.
Genes determine the __________________________ of __________________________
in a protein. Changing the __________________________ of the amino acids makes a __________________________ protein.
A man has a discolored area on the back of his hand. The doctor has assured him it is a harmless body cell mutation. Explain why the mutation probably will not appear in his children.

_I found this information on page ___________.

Complete the table on the 3 main kinds of RNA.

<table>
<thead>
<tr>
<th>Type of RNA</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRNA</td>
<td>carries the code to make proteins from the nucleus to the cytoplasm</td>
</tr>
<tr>
<td>transfer RNA (tRNA)</td>
<td>type of RNA contained in ribosomes</td>
</tr>
</tbody>
</table>

Complete the steps of protein production within a cell.
1. mRNA moves into the cytoplasm.
2. A(n) ____________ attaches to it.
3. ____________ molecules bring ____________ to the ribosomes.
4. Nitrogen bases on the ____________ temporarily ____________ the nitrogen bases on the ____________.
5. The same process occurs with another ____________ molecule and the next portion of the ____________ molecule.
6. The ____________ attached to the two ____________ molecules ____________, beginning the formation of a protein.

Describe how mutations can affect an organism.

.CONNECT IT

I found this information on page ___________.

Mutations

Section 3 DNA (continued)
Tie It Together

Synthesize

*Draw an animal cell with six chromosomes.*
*Follow the chromosomes as they go through the steps of meiosis.*
*Show the chromosomes duplicating and separating, and describe the final end products.*
*Name each step in the process.*
*Show one way that a mutation might occur during the process.*
Now that you have read the chapter, think about what you have learned and complete the table below. Compare your previous answers with these.

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

<table>
<thead>
<tr>
<th>Cell Reproduction</th>
<th>After You Read</th>
</tr>
</thead>
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<tr>
<td>• Most of the cells formed in your body do not contain genetic material.</td>
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</tr>
</tbody>
</table>

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☐ Study the definitions of vocabulary words.
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☐ Review the Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

**Summarize It**

List three important ideas from this chapter.
Heredity

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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Heredity</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Offspring of an organism always have the same traits as the parents.</td>
<td></td>
</tr>
<tr>
<td>• There may be more than two forms of a gene.</td>
<td></td>
</tr>
<tr>
<td>• Some traits are determined by more than one gene.</td>
<td></td>
</tr>
<tr>
<td>• Traits from one type of organism can be introduced into another type of organism.</td>
<td></td>
</tr>
</tbody>
</table>

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

Write three traits that you have and how you would determine how those traits were passed to you.

__________________________
__________________________
__________________________
__________________________
__________________________
__________________________
Heredity
Section 1 Genetics

**Skim** Section 1 of the chapter. Write two questions that come to mind from reading the headings of this section.
1. __________________________
2. __________________________

**Review Vocabulary**

**Define** meiosis.

meiosis

**New Vocabulary**

Write a paragraph describing heredity. Use the five vocabulary terms from the left in your paragraph.

heredity

.genetics

allele

dominant

recessive

Write a paragraph describing genotype. Use the five vocabulary terms from the left in your paragraph.

Punnett square

.genotype

.phenotype

.homozygous

.heterozygous

**Academic Vocabulary**

Use a dictionary to define physical as it applies to life science.

physical
Main Idea

**Inheriting Traits**

I found this information on page __________.

**Mendel—The Father of Genetics**

I found this information on page __________.

**Genetics in a Garden**

I found this information on page __________.

Details

**Summarize** *what alleles are and how they are inherited.*

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

**Identify** *three things Mendel did that made his work more useful than previous studies of heredity.*

1. ________________________________________________________________________

2. ________________________________________________________________________

3. ________________________________________________________________________

**Analyze** *one trait that Mendel studied.*

- Identify the *dominant* and *recessive* forms of the trait.
- Predict how an organism would look if it had two dominant alleles, two recessive alleles, or one of each allele.

<table>
<thead>
<tr>
<th>Trait</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant form</td>
<td></td>
</tr>
<tr>
<td>Recessive form</td>
<td></td>
</tr>
<tr>
<td>Two dominant alleles</td>
<td></td>
</tr>
<tr>
<td>Two recessive alleles</td>
<td></td>
</tr>
<tr>
<td>One of each allele</td>
<td></td>
</tr>
</tbody>
</table>
**Main Idea**

**Genetics in a Garden**

I found this information on page ___________.

**Details**

**Complete** the Punnett square for black and blond fur in a dog.

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>b</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blond dog</strong></td>
<td>b</td>
<td></td>
</tr>
<tr>
<td><strong>Black dog</strong></td>
<td>B</td>
<td>b</td>
</tr>
</tbody>
</table>

**Analyze** the Punnett square to complete the sentences.

The black dog carries ____________ black-fur traits. The blond dog carries ____________ blond-fur traits. The chance that the offspring will have black fur is ____________, or ____________ in ____________.

**Summarize** Mendel’s three principles of heredity.

1. __________________________________________________________________________

2. __________________________________________________________________________

3. __________________________________________________________________________

**CONNECT IT**

A pea plant is *heterozygous* for purple flowers (Rr). A gardener crosses it with another pea plant with the same *genotype*. The recessive gene for this trait causes white flowers. Predict the possible genotypes and *phenotypes* for the offspring. Predict the percentage for each genotype and phenotype.

______________________________________________________________________________

______________________________________________________________________________
Heredity
Section 2 Genetics Since Mendel

Scan the headings and illustrations in Section 2. Write two facts you learned about genetics as you scanned the section.

1. 

2. 

Define gene to show its scientific meaning.

gen

Define each vocabulary term.
incomplete dominance

polygenic inheritance

sex-linked gene

Use a dictionary to define intermediate. Then rewrite the sentence below, using your definition.

When the allele for white four-o’clock flowers and the allele for red four-o’clock flowers combined, the result was an intermediate phenotype—pink flowers.

intermediate
Main Idea

**Incomplete Dominance**

I found this information on page _________.

Details

Draw a Punnett square for red and white four-o’clock flowers showing the possible offspring. Use R for the allele for red flowers and R’ for the allele for white flowers. In each section of the square, write the genotype and phenotype of the offspring.

<table>
<thead>
<tr>
<th>Red four-o’clock</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
</tr>
<tr>
<td>R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>White four-o’clock</th>
</tr>
</thead>
<tbody>
<tr>
<td>R’</td>
</tr>
<tr>
<td>R’</td>
</tr>
</tbody>
</table>

Summarize incomplete dominance.

I found this information on page _________.

Analyze how a gene with multiple alleles can produce more than three phenotypes. Use blood types as an example.

Identify how internal environment can affect the expression of a trait. Complete the flow chart.

Gene for bright plumage is present.

- Chemicals ______ activate gene.
- Gene ______ expressed.

female bird

- Chemicals ______ activate gene.
- Gene ______ expressed.

male bird
Analyze how chromosome disorders occur.

A chromosome disorder occurs as a result of a ____________ _________________ . It causes an organism to have ________________ chromosomes than normal.

Model how two heterozygous parents who do not have a recessive disorder can have a child with the disorder. Use C for a dominant allele and c for a recessive allele.

Mother’s genotype: ________

Child’s genotype: ________

Father’s genotype: ________

Complete the statements about sex-linked traits.

Sex-linked disorders usually result from ________________ alleles on the ________ chromosome. A man will have the disorder when ________________ . A woman will have the disorder when ________________ .

Summarize why pedigrees are useful to geneticists.

Pedigrees Trace Traits

I found this information on page ____________ .

Choose a trait described in Section 2, such as color-blindness, calico patterns in cats, or cystic fibrosis. Choose genotypes for two parents. Draw a pedigree starting with these parents. Continue your pedigree for two generations. Use Punnett squares to help you predict possible offspring.
Preview the section title and headings. Write three questions that you would ask a modern geneticist after your preview.

1. 

2. 

3. 

Use DNA in an original sentence to show its scientific meaning.

DNA

Define genetic engineering.

Use a dictionary to define insert as a verb. Then find a sentence in Section 3 that uses the term or a form of the term.

insert
Main Idea

Genetic Engineering

Organize information about recombinant DNA. Complete the graphic organizer.

I found this information on page __________.

Distinguish three uses for genetic engineering.

1. __________________________

2. __________________________

3. __________________________

Summarize how gene therapy may be used in the future.

I found this information on page __________.
Main Idea

Genetic Engineering

I found this information on page _________.

Create a flow chart about gene therapy. Show how the gene gets into the body and what happens when it reaches the cells.

Details

Summarize each step of gene therapy in your model above.

1. __________________________
2. __________________________
3. __________________________

Evaluate the benefits and potential risks of genetic engineering of crop plants.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONNECT IT

Describe how viruses are useful tools in genetic engineering.
Tie It Together

Explain Genetics

Suppose that Gregor Mendel came to visit a modern genetics laboratory and you were asked to give him a tour. Write a report describing what you would show him and how you would explain modern genetics. Remember that he does not know the words gene or allele, although he described “factors” that controlled traits.
Now that you have read the chapter, think about what you have learned and complete the table below. Compare your previous answers with these.

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

<table>
<thead>
<tr>
<th>Heredity</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Offspring of an organism always have the same traits as the parents.</td>
<td></td>
</tr>
<tr>
<td>• There may be more than two forms of a gene.</td>
<td></td>
</tr>
<tr>
<td>• Some traits are determined by more than one gene.</td>
<td></td>
</tr>
<tr>
<td>• Traits from one type of organism can be introduced into another type of organism.</td>
<td></td>
</tr>
</tbody>
</table>

Review

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☐ Study the definitions of vocabulary words.
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☐ Review the Self Check at the end of each section.
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Summarize It

Identify the three most important ideas in this chapter.
Adaptations over Time

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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Adaptations over Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Traits acquired by an organism during its life can be passed on to its offspring.</td>
<td></td>
</tr>
<tr>
<td>• Most evidence of evolution comes from fossils.</td>
<td></td>
</tr>
<tr>
<td>• Organisms with traits best suited to their environment are more likely to survive and reproduce.</td>
<td></td>
</tr>
<tr>
<td>• Humans share a common ancestor with other primates.</td>
<td></td>
</tr>
</tbody>
</table>

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

*Science Journal*

*Pick a favorite plant or animal and list all the ways it is well-suited to its environment.*

---

*Adaptations over Time* 131
Adaptations over Time

Section 1 Ideas About Evolution

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

1. 
2. 
3. 

**Define** gene using your book.

**Write the correct term next to its definition.**

- gene: group of organisms that share similar characteristics and can reproduce among themselves, producing fertile offspring
- change in inherited characteristics over time
- process by which organisms with traits best suited to their environment are more likely to survive and reproduce
- inherited trait that makes an individual different from other members of its species
- any variation that makes an organism better suited to its environment

**Use your book or a dictionary to define hypothesis.**
Section 1  Ideas About Evolution (continued)

**Main Idea**

**Early Models of Evolution**

I found this information on page ________.

**Darwin’s Model of Evolution**

I found this information on page ________.

**Natural Selection**

I found this information on page ________.

**Variation and Adaptation**

I found this information on page ________.

**Details**

Identify why Lamarck’s theory of evolution was not accepted.

- ...

- ...

- ...

Analyze Darwin’s explanation of the origins of the 13 species of Galápagos finches. Fill in the missing words.

The Galápagos finches _____________ for food. Those that had _____________, _____________ that allowed them to get food were able to _____________ longer and _____________ more. Over time, groups of finches became separate _____________.

State 5 main principles of natural selection.

1. _____________
2. _____________
3. _____________
4. _____________
5. _____________

Compare and contrast variations and adaptations.

<table>
<thead>
<tr>
<th>Variation</th>
<th>Adaptation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td></td>
</tr>
<tr>
<td>Examples</td>
<td></td>
</tr>
</tbody>
</table>
Complete the table explaining factors that can lead to changes in a population.

<table>
<thead>
<tr>
<th>Changes in Gene Sources</th>
<th>What Happens</th>
<th>How It Leads to Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geographic Isolation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compare and contrast gradualism and punctuated equilibrium. Select ideas from your reading to fill in the Venn diagram.

Describe how natural selection can lead to the formation of a new species. Include factors such as migration and geographic isolation.
Adaptations over Time
Section 2 Clues About Evolution

Scan Section 2 of your book. Then write two items in each of the boxes below.

<table>
<thead>
<tr>
<th>What I know about fossils</th>
<th>What I want to know about fossils</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Review Vocabulary
Define epoch using your book.

epoch

New Vocabulary
Use your book to help you write the correct vocabulary term next to each definition.

a type of rock made from pieces of other rocks, minerals deposited from a solution, or plant and animal matter

element that gives off a steady amount of radiation as it slowly changes to a nonradioactive element

study of embryos and their development

similar in structure, origin, or function

structure that does not seem to have a function and that may once have functioned in the body of an ancestor

Academic Vocabulary
Use a dictionary to define method.

method

Date
Main Idea

Clues from Fossils

Create a concept map to summarize information about the Green River formation. Include information about

- where it is
- what it was in the past
- how fossils formed, and
- what scientists learn from the fossils there.

Details

Types of Fossils

Summarize the types of rock in which fossils are commonly found.

Most fossils are found in ___________ rock. They are most often found in ___________.

Determining a Fossil’s Age

Organize information about how scientists determine the age of fossils. Complete the outline.

I. Relative dating

A. __________________________________________________________________________
   __________________________________________________________________________

   B. provides an estimate of a fossil’s age by
   __________________________________________________________________________

II. Radiometric dating

A. __________________________________________________________________________

   B. Scientists estimate age by
   __________________________________________________________________________
Create a graphic organizer to identify what scientists learn from fossils.

Information obtained from fossils

| Other clues about evolution |

Organize information about other clues scientists use to study evolution.

A scientist discovers a new species of mammal. How could the scientist determine its evolutionary relationships to other animals? Explain how the scientist could use each type of evidence discussed in the section.
Adaptations over Time
Section 3 The Evolution of Primates

Skim Section 3 of your book. Read the headings. Write three questions that come to mind.

1. ____________________________________________

2. ____________________________________________

3. ____________________________________________

Define opposable using your book.

opposable

Use your book to define the following terms. Then use each term in a sentence.

primates

hominid

Homo sapiens

Use a dictionary to define similar.

similar
Section 3  The Evolution of Primates (continued)

Main Idea

Primates

I found this information on page ___________.

I found this information on page ___________.

I found this information on page ___________.

Details

Analyze adaptations that are common among primates by completing the table below. List three primate adaptations and the functions each allows.

<table>
<thead>
<tr>
<th>Adaptation</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Distinguish three characteristics of hominids.

1. ____________________________

2. ____________________________

3. ____________________________

Sequence the ancestors of early humans. Create a timeline of hominids in the boxes below. Identify and describe the hominid that lived during each time period.

**Time period:** 4–6 million years ago

**Hominid:**

**Characteristics:**

**Time period:** 1.5–2 million years ago

**Hominid:**

**Characteristics:**

**Time period:** 1.6 million years ago

**Hominid:**

**Characteristics:**
Section 3 The Evolution of Primates (continued)

Main Idea

Humans

Organize information about the origins of modern humans. Complete the diagram.

Early Homo sapiens
(about 400,000 years ago)

_________________ about
_________________ years ago

_________________ about
_________________ years ago

(Homo sapiens sapiens)

Contrast Neanderthals and Cro-Magnon humans by completing the diagram.

Neanderthals

Cro-Magnon humans

CONNECT IT

Hypothese how scientists might determine whether Neanderthals are ancestors of modern humans.

I found this information on page ___________.

I found this information on page ___________.

Name __________________________ Date ____________
Tie It Together

Make Fossils

*With a partner, model a set of fossils that show how organisms can change over time. Draw or model three related organisms. One should be the original organism. The others should be descendants of the original organism. Record the adaptations shown by your fossils. What environmental changes might have led to the adaptations?*

*Trade fossils with another pair. Describe the fossils that you are given. What adaptations can you find?*
Adaptations over Time  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 with these.

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

<table>
<thead>
<tr>
<th>Adaptations over Time</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Traits acquired by an organism during its life can be passed on to its offspring.</td>
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</tr>
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SUMMARIZE IT

After reading this chapter, identify three things that you have learned about adaptations of organisms over time.
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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Circulation and Immunity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• All blood cells are the same.</td>
</tr>
<tr>
<td></td>
<td>• Your heart is an organ made of muscle tissue.</td>
</tr>
<tr>
<td></td>
<td>• White blood cells help your body fight disease.</td>
</tr>
<tr>
<td></td>
<td>• Washing a small wound with soap and water is helpful in preventing an infection.</td>
</tr>
</tbody>
</table>

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

Write three questions you have about blood, circulation, and how diseases are spread.
Scan. Section 1 of your book. Write two facts you discovered about blood while scanning the section.

1. 

2. 

Define. diffusion.

diffusion

---

Use your book to define the following terms.

plasma

---

hemoglobin

---

platelet

---

Use a dictionary to find the scientific definition of the term factor. Find a sentence in the section in which the word is used and write the sentence below.

factor

Definition: 

---

Sentence: 

---
Organize information about the functions of blood by completing the graphic organizer.

**Functions of Blood**

I found this information on page __________.

**Parts of Blood**

I found this information on page __________.

<table>
<thead>
<tr>
<th>Part</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plasma</td>
<td></td>
</tr>
<tr>
<td>Red blood cells</td>
<td></td>
</tr>
<tr>
<td>White blood cells</td>
<td></td>
</tr>
<tr>
<td>Platelets</td>
<td></td>
</tr>
</tbody>
</table>

**Blood Clotting**

I found this information on page __________.

Sequence events that happen as a cut begins to heal.

Platelets stick to the wound and release chemicals.

1. Platelets
2. __________
3. __________
Define antigens and antibody.

Antigens: ______________________________________________________________________

Antibody: ______________________________________________________________________

Organize information about the causes and effects of diseases of the blood.

<table>
<thead>
<tr>
<th>Causes</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>loss of blood</td>
<td>normal blood cells are crowded out</td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Anemia</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
</tr>
<tr>
<td>Leukemia</td>
<td></td>
</tr>
</tbody>
</table>

Your aunt needs a blood transfusion. She has type AB— blood. You have type O+ blood. Can you donate blood to her? Explain.
Preview Section 2 by reading the What You’ll Learn statements. Rewrite them as questions. Answer these questions as you read.

1.
2.
3.
4.

Define tissue using its scientific meaning.

Match the correct vocabulary term with its definition.

blood vessel that connects arteries and veins
fluid that has diffused into the lymphatic capillaries
blood vessel that carries blood to the heart
blood vessel that carries blood away from the heart

Use a dictionary to define the term constant as it is used in the following sentence.

This message from the brain helps keep blood pressure constant within your arteries so that enough blood reaches all organs and tissues in your body.
The Heart

I found this information on page _________.

Complete the paragraph describing the heart.

The heart is a(n) _________ made of _____________ tissue. It is located behind the _________ and between the _________. The heart has _______________. The upper chambers are called the _____________ and _____________ and the _____________ and _____________. The lower chambers are called the _____________ and _____________.

Label the diagram, and add arrows to trace the flow of blood between the heart, lungs, and body.

left side of heart

right side of heart

Compare blood vessels by describing them in the chart below.

<table>
<thead>
<tr>
<th>Types of Blood Vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vessel</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Arteries</td>
</tr>
<tr>
<td>Veins</td>
</tr>
<tr>
<td>Capillaries</td>
</tr>
</tbody>
</table>

Blood Vessels

I found this information on page _________.

Main Idea

Section 2 Circulation (continued)

Types of Circulation

I found this information on page _________.
Main Idea

Blood Pressure
I found this information on page _________.

Cardiovascular Disease
I found this information on page _________.

Functions of the Lymphatic System
I found this information on page _________.

Details

Summarize how blood pressure is maintained by the body.

Organize information about cardiovascular disease in the chart.

Cardiovascular disease

<table>
<thead>
<tr>
<th>Disease</th>
<th>Atherosclerosis</th>
<th>Hypertension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effect</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model the pathway of fluid through the circulatory and lymphatic systems by completing the cycle chart below.

CONNECT IT

Identify habits that may decrease or increase your chances of developing atherosclerosis and hypertension.
Circulation and Immunity

Section 3 Immunity

**Skim** through Section 3 of this chapter. Identify two things you think you will learn in this section.

1. 
2. 

**Review Vocabulary**

 Define the word enzyme using its scientific meaning.

 enzyme

**New Vocabulary**

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

 passive immunity

 antibody

 active immunity

 antigen

**Academic Vocabulary**

 Use a dictionary to define the word passive using its scientific meaning. Find a sentence in your book that uses the word.

 passive

 Definition: 

 Sentence: 

 Name ___________________________ Date ___________________________
Main Idea

Lines of Defense
I found this information on page __________.

Details

Organize information about the body’s first-line defenses against disease.

First-line Defenses

I found this information on page __________.

Summarize two ways your skin protects you from disease.
1. ________________________________________________
   ________________________________________________
2. ________________________________________________
   ________________________________________________

Compare and contrast characteristics of the 3 systems of internal first-line defenses.

<table>
<thead>
<tr>
<th>Internal First-line Defenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory System</td>
</tr>
<tr>
<td>Digestive System</td>
</tr>
<tr>
<td>Circulatory System</td>
</tr>
</tbody>
</table>

Circulation and Immunity 151
Sequence events that occur when tissue becomes inflamed.

- Pathogens infect tissue and cause it to be inflamed.

- White blood cells surround and engulf pathogenic bacteria.

Summarize the 4 steps of response to disease-causing organisms.

1. Recognition: 
   - A woman had chicken pox when she was a child. Explain how this affects her susceptibility to chicken pox as an adult.

2. Mobilization: 

3. Disposal: 

4. Immunity: 

CONNECT IT
Circulation and Immunity
Section 4 Diseases

Skim Section 4 and predict four topics that you will study in this section.
1. 
2. 
3. 
4. 

Define virus using its scientific meaning.

Write the correct vocabulary term next to its definition.

- disease caused by a virus, bacterium, fungus, or protist that is spread from one person to another
- substance that causes an allergic reaction
- disease that is not caused by a pathogen
- process in which a liquid is heated to a temperature that kills most bacteria

Use a dictionary to define the word enable. Rewrite the following sentence, substituting the new meaning.

Insulin is a hormone that enables glucose to pass from the bloodstream into your cells.

enable
Main Idea

**Disease in History**

*I found this information on page ________.*

**Infectious Diseases**

*I found this information on page ________.*

**HIV and Your Immune System**

*I found this information on page ________.*

---

**Details**

**Summarize** *the discoveries made by these scientists about disease.*

Louis Pasteur: __________________________

______________________________

Robert Koch: __________________________

______________________________

Joseph Lister: __________________________

______________________________

**Organize** *information on the ways infectious diseases can spread.*

---

**Complete** *the following paragraph about AIDS.*

HIV attacks the ____________ in the immune system. The virus enters the T cell and ____________. When the infected cell ____________, it releases more ____________. These infect other ____________. Soon, ____________ cannot produce ____________. The immune system is unable to fight HIV or any other ____________.
Organize information by listing five ways to prevent infection.

1. 
2. 
3. 
4. 
5. 

Summarize the characteristics of allergies and diabetes.

<table>
<thead>
<tr>
<th>Cause</th>
<th>Allergies</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effect</th>
<th>Allergies</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Choose one behavior that can help prevent cancer or another chronic disease. Explain how the behavior helps prevent the disease.
Circulation and Immunity￥ 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 with these.

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<th>Circulation and Immunity</th>
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</tr>
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Summarize It
Identify three of the most important ideas in this chapter.
Digestion, Respiration, and Excretion

Before You Read

Preview the chapter title, the section titles, and the section headings. List at least one idea for each section in each column.

<table>
<thead>
<tr>
<th>K</th>
<th>What I know</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>What I want to find out</td>
</tr>
</tbody>
</table>

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

Science Journal

Write a paragraph describing what you do to help your body recover after an active game.
Scan the title and headings in Section 1. Predict three topics that might be discussed in this section.

1. ____________________________________________
2. ____________________________________________
3. ____________________________________________

Write an original sentence to show the scientific meaning of the word bacteria.

bacteria ________________________________________

Find a sentence in Section 1 that uses each vocabulary term or a form of the term.

nutrient ________________________________________

enzyme ________________________________________

peristalsis ______________________________________

chyme _________________________________________

villi ___________________________________________

Define contract as a verb using a dictionary.

contract ______________________________________
Sequence the steps of the digestive process. Identify what occurs during each step.

Step: ______________
What happens: ____________________________

Step: Digestion
What happens: ____________________________
Chemical: ____________________________
Mechanical: ____________________________

Step: ______________
What happens: ____________________________

Step: ______________
What happens: ____________________________

Enzymes
Summarize how enzymes are important by completing the statements below.

Enzymes _______________ and help you digest ____________________________.
They are produced in ____________________________
__________________________________________
Enzymes also are important because they _______________
__________________________________________ and
__________________________________________.
Suppose you eat a sandwich that provides protein, carbohydrates, and fat. Describe what happens to the sandwich as it moves through your digestive system.

<table>
<thead>
<tr>
<th>SUMMARIZE IT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppose you eat a sandwich that provides protein, carbohydrates, and fat. Describe what happens to the sandwich as it moves through your digestive system.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model and label the organs involved in digestion. Circle the labels of organs that are part of the digestive tract.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Identify two ways bacteria in the digestive system help the body.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Organ of the Digestive System</th>
</tr>
</thead>
<tbody>
<tr>
<td>I found this information on page __________.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bacteria Are Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>I found this information on page __________.</td>
</tr>
</tbody>
</table>
Digestion, Respiration, and Excretion

Section 2 Nutrition

Scan the illustrations in Section 2. Write three questions that come to mind. As you read, look for answers to your questions.

1. 
2. 
3. 

Review Vocabulary

Define molecule to show its scientific meaning.

molecule

New Vocabulary

Use your book to define the following terms.

amino acid

carbohydrate

vitamin

mineral

Academic Vocabulary

Use a dictionary to define source. Then write an original sentence using the term.

source

Name ___________________________ Date ___________________________
Why do you eat?
I found this information on page _________.

Classes of Nutrients
I found this information on page _________.

Complete the paragraph to summarize the importance of food.

Food provides _____________________________.

The ___________________ of food is its most important quality, but many people choose food based on ___________________ and ___________________.

Identify the 6 major classes of nutrients.
1. ______________ 3. ______________ 5. ______________
2. ______________ 4. ______________ 6. ______________

Summarize why proteins are important nutrients.

Organize information about the three types of carbohydrates.

<table>
<thead>
<tr>
<th>Type</th>
<th>Food Sources</th>
<th>Use in Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiber</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarize four functions that fat has in the body.
1. _______________________
2. _______________________
3. _______________________
4. _______________________
Main Idea

Distinguish between water-soluble and fat-soluble vitamins.

<table>
<thead>
<tr>
<th>Water-Soluble Vitamins</th>
<th>Fat-Soluble Vitamins</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Label each description with the mineral it describes.

___________ helps clot blood and maintain strong teeth and bones.

___________ helps muscle contraction.

___________ allows oxygen to be transported by red blood cells.

Food Groups

Model serving size for different food categories.

<table>
<thead>
<tr>
<th>Group</th>
<th>Recommended Servings per Day</th>
<th>Examples of 1 Serving Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread and cereal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk, yogurt, or cheese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meat, beans, and eggs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Connect It

Plan a daily menu that provides the recommended servings from each food group. Identify some nutrients that each food in your menu provides.

Name ___________________________ Date ________________

Section 2 Nutrition (continued)
Scan Section 3 using the checklist below.

- Read all headings.
- Read all bold words.
- Look at each illustration.
- Think about what you already know about breathing.

Write two predictions you have for subjects that will be covered in this section.

1. ____________________________
2. ____________________________

Define diaphragm as it relates to the respiratory system.

diaphragm

Write the vocabulary term that matches each definition.

- tiny, thin-walled sacs at the end of bronchioles
- air-conducting tube that connects the larynx with the bronchi
- airway to which the vocal cords are attached
- two short tubes that carry air into the lungs

Read the sentence below. Analyze what coordinate means in this sentence.

Your brain coordinates the movement of the muscles in your throat, tongue, cheeks, and lips when you talk.

cordinate
Functions of the Respiratory System

I found this information on page ___________.

Sequence the process of breathing and cellular respiration.

Breathing in brings oxygen into the body.

Blood ____________________________.

Cells _______________________________.

Cells produce carbon dioxide and water as waste.

Blood ____________________________.

Breathing out ____________________________.

Create a drawing of the respiratory system. Label the nasal cavity, larynx, pharynx, trachea, lungs, bronchi, and alveoli. Write a caption explaining the function of each part of the system.
Section 3 The Respiratory System (continued)

Main Idea

Why do you breathe?
I found this information on page ___________.

Details

Analyze how carbon dioxide in the blood affects breathing rate.

Model the role of the diaphragm in breathing. Make one diagram of the lungs and diaphragm for when a person inhales and one for exhaling. Use arrows to show how the lungs and diaphragm move.

Classify respiratory diseases and disorders. Complete the chart.

<table>
<thead>
<tr>
<th>Disease or Disorder</th>
<th>Cause or Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory infections</td>
<td></td>
</tr>
<tr>
<td>Chronic bronchitis</td>
<td></td>
</tr>
<tr>
<td>Lung cancer</td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td></td>
</tr>
</tbody>
</table>

SYNTHESIZE IT

Describe how emphysema affects cellular respiration and cell function.

Name ___________________________ Date ________________

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Digestion, Respiration, and Excretion
Section 4 The Excretory System

Read the What You’ll Learn statements for Section 4. Rewrite each statement as a question. As you read, look for the answers to your questions.

1. ___________________________________________________________

2. ___________________________________________________________

3. ___________________________________________________________

Define capillary to show its scientific meaning.

capillary

Use your book to define the following terms.
nephron

ureter

bladder

Use a dictionary to define eliminate. Then rewrite the following sentence, substituting the meaning you found for the word eliminate.

You eliminate some salts when you sweat.

eliminate
Summarize the ways in which the body excretes, or removes, waste. Complete the chart to show what each body system excretes.

<table>
<thead>
<tr>
<th>Excretion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digestive System</td>
</tr>
<tr>
<td>Respiratory System</td>
</tr>
<tr>
<td>Skin</td>
</tr>
<tr>
<td>Urinary System</td>
</tr>
</tbody>
</table>

Analyze the importance of excretion by completing the sentence.
If the body did not excrete wastes, ________________

Summarize the function of each part of the urinary system.

Kidneys: ________________
Renal arteries: ________________
Renal veins: ________________
Ureters: ________________
Bladder: ________________
Urethra: ________________
### Main Idea

I found this information on page ___________.

### Sequence the steps of filtration in the kidneys.

1. Blood enters the kidneys through the renal artery.

2. 

3. 

4. 

5. 

6. The liquid left behind flows into collecting tubules and then into ureters.

### Urinary Diseases and Disorders

I found this information on page ___________.

### Identify the effects of kidney failure.

- 
- 
- 
- 
- 

### SYNTHESIZE IT

Identify effects of excretory system malfunction.

- 
- 
- 
- 
- 

---

Name __________________________ Date ____________

Section 4 The Excretory System (continued)
Digestion, Respiration, and Excretion
Chapter Wrap-Up

Review the ideas you listed in the chart at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the chart by filling in the third column. How do your ideas compare with those you provided at the beginning of the chapter?

<table>
<thead>
<tr>
<th>K</th>
<th>What I know</th>
<th>W</th>
<th>What I want to find out</th>
<th>L</th>
<th>What I learned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 Self Check at the end of each section.
- Look over the Chapter Review at the end of the chapter.

**SUMMARIZE IT**

Identify the three most important ideas from this chapter.
Support, Movement, and Responses

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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Support, Movement, and Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Your skin is the largest organ of your body.</td>
</tr>
<tr>
<td></td>
<td>• No matter how still you might be, some muscles in your body are always moving.</td>
</tr>
<tr>
<td></td>
<td>• Living bone is an organ made of several different tissues.</td>
</tr>
<tr>
<td></td>
<td>• The basic working units of the nervous system are nerve cells.</td>
</tr>
</tbody>
</table>

FOLDABLES Study Organizer

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

SCIENCE JOURNAL

Imagine for a moment that your body does not have a support system. How will you perform your daily activities? Explain your reasoning.
Scan the section by following the checklist below.

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

Write three facts that you discovered about the skin as you scanned this section.

1. ____________________________
2. ____________________________
3. ____________________________

Define organ as it relates to the body, and use it in an original sentence.

organ

Use your book to define the following terms.

epidermis

melanin

Use a dictionary to define regulate.

regulate
Section 1 The Skin (continued)

Main Idea

Skin Structures

I found this information on page ________.

Details

Model the skin by drawing and labeling its parts.

Skin Functions

I found this information on page ________.

Create a graphic organizer to identify the five major functions of the skin.
Section 1 The Skin (continued)

Main Idea

Skin Injuries and Repair

I found this information on page _______.

Details

Complete the graphic organizer to identify types of skin injuries.

Types of Skin Injuries

- Damage from exposure to harsh conditions

Sequence the steps involved in the formation of a bruise and its healing.

Red blood cells leak into tissue and release hemoglobin.

I found this information on page _______.
Support, Movement, and Responses
Section 2 The Muscular System

Scan the headings in Section 2. Read the headings and examine the illustrations. Write three questions that come to mind.
1. ____________________________
2. ____________________________
3. ____________________________

**Review Vocabulary**

Define muscle using your book or a dictionary.

**muscle**

---

**New Vocabulary**

Use your book to define the following terms. Then write a sentence for each term.

**voluntary muscle**

---

**involuntary muscle**

---

**tendon**

---

**Academic Vocabulary**

Use a dictionary to define voluntary.

**voluntary**

---
**Main Idea**

**Movement of the Human Body**

I found this information on page ________.

**Details**

**Compare and contrast** movements of voluntary and involuntary muscles by using the terms provided to complete the Venn diagram.

- able to relax
- controlled consciously
- able to contract
- cannot control consciously

- provides force for movement
- face muscle
- stomach muscle

**Classification of Muscle Tissue**

I found this information on page ________.

**Classification** the types of muscle tissues in the graphic organizer.

**Types of Muscle Tissues**

- Striated
- Nonstriated
Your Body’s Simple Machines—Levers

I found this information on page ___________.

Model the three types of levers found in the body by providing simple drawings to illustrate the positions of the fulcrum, effort force, and load in each type.

first-class lever  second-class lever  third-class lever

Complete the following paragraph about how muscles work by filling in the missing words or phrases.

Muscles work together in ______________ so that your body can move. As one muscle ______________, the other ______________. Muscles ______________ push; they always ______________.

When the muscles on the back of your upper leg contract, they ______________ and pull your lower leg back and up. When you straighten your leg, the muscles on the back of your upper leg ______________ and lengthen, and the muscles on the front of your upper leg ______________.

SYNTHESIZE IT

Explain why a runner may have difficulty walking steadily after a long race.
Support, Movement, and Responses
Section 3 The Skeletal System

**Predict** three things that will be discussed in Section 3. Read the section’s headings to help you make your predictions.

1. 
2. 
3. 

**Define** skeleton.

skeleton

**Find a sentence in Section 3 that includes each vocabulary term.**

periosteum

cartilage

joint

ligament

**Use a dictionary to define** internal.

internal
Section 3 The Skeletal System (continued)

**Main Idea**

**Functions of Your Skeletal System**

_I found this information on page ___________._

**Bone Structure**

_I found this information on page ___________._

**Details**

**Summarize** the functions of the skeletal system on the lines below.

1. __________________________________________________________________________

2. __________________________________________________________________________

3. __________________________________________________________________________

4. __________________________________________________________________________

5. __________________________________________________________________________

**Distinguish** compact bone from spongy bone by identifying a characteristic and the importance of each type of bone.

<table>
<thead>
<tr>
<th>Type of Bone</th>
<th>Characteristic</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Create** a graphic organizer to identify five characteristics of cartilage that make it important in joints.
**Bone Formation**

Compare the roles of osteoblasts and osteoclasts in the formation and breakdown of bone tissue.

- Osteoblasts
- Osteoclasts

**Joints**

Organize the different types of joints in a graphic organizer.

**Summarize** the purpose of cartilage at joints in the human body on the lines below.

- 
- 
- 
- 
- 

---

Support, Movement, and Responses
Support, Movement, and Responses
Section 4 The Nervous System

Scan the headings in Section 3 to identify the body’s senses.
1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________

Define homeostasis.
homeostasis ____________________________

Scan within the section for bold words and their meanings. Then write the correct term next to its definition.

brain and spinal cord

all of the nerves that connect the brain and spinal cord to other body parts

erve cell

small space in which an impulse crosses from one neuron to another

Use a dictionary to define adjust.

______________________________
Main Idea

How the Nervous System Works

I found this information on page __________.

Details

Complete the graphic organizer below to illustrate how the nervous system acts as a control system for the body.

Complete the graphic organizer below to illustrate how the nervous system acts as a control system for the body.

Sequence the structures of a neuron in the order in which an impulse travels.

1. _____________ 2. _____________ 3. _____________

Organize the parts of the nervous system in this graphic organizer.

Nerve Cells

I found this information on page __________.

The Divisions of the Nervous System

I found this information on page __________.
Section 4 The Nervous System (continued)

Main Idea

Safety and the Nervous System

Identify the sensory organs and their receptors for each sense.

Drugs Affect the Nervous System

Summarize the effects of depressants and stimulants on the body.

1. Depressants
2. Stimulants

Connect It

Evaluate how alcohol use could affect the ability of a person riding a bicycle.
Support, Movement, and Responses

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 with these.

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

<table>
<thead>
<tr>
<th>Support, Movement, and Responses</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Your skin is the largest organ of your body.</td>
<td></td>
</tr>
<tr>
<td>• No matter how still you might be, some muscles in your body are always moving.</td>
<td></td>
</tr>
<tr>
<td>• Living bone is an organ made of several different tissues.</td>
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</tr>
<tr>
<td>• The basic working units of the nervous system are nerve cells.</td>
<td></td>
</tr>
</tbody>
</table>

Review

Use this checklist to help you study.

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☐ Study the definitions of vocabulary words.
☐ Review daily homework assignments.
☐ Re-read the chapter and review the charts, graphs, and illustrations.
☐ Review the Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three main ideas that you have learned about body systems.
Regulation and Reproduction

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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Regulation and Reproduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Endocrine glands are tissues that produce hormones.</td>
</tr>
<tr>
<td></td>
<td>• Testosterone is the male sex hormone and sperm is the male reproductive cell.</td>
</tr>
<tr>
<td></td>
<td>• Identical twins are not always the same sex.</td>
</tr>
<tr>
<td></td>
<td>• Adulthood is the final stage of human development.</td>
</tr>
</tbody>
</table>

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

Science Journal

Write a paragraph describing how an emergency call might be handled at a fire station.
### Regulation and Reproduction

**Section 1 The Endocrine System**

**Scan** the headings, charts, and illustrations in Section 1. Find two glands of the endocrine system that are involved in regulating blood sugar levels and two glands that are involved in regulating calcium levels.

<table>
<thead>
<tr>
<th>Helps Regulate Blood Sugar Levels</th>
<th>Helps Regulate Calcium Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Review Vocabulary**

**Define** tissue to show its scientific meaning. Then use the word in an original sentence.

- tissue
  - 
  - 
  - 
  - 

**New Vocabulary**

**Define** hormone to show its scientific meaning.

- hormone
  - 
  - 
  - 
  - 

**Academic Vocabulary**

**Define** distribute to show its scientific meaning. Then use the word in an original sentence.

- distribute
  - 
  - 
  - 
  - 

---

186  *Regulation and Reproduction*
Section 1 The Endocrine System (continued)

Main Idea

Functions of the Endocrine System

I found this information on page __________.

Details

Organize information about the body's control systems by completing the chart below.

<table>
<thead>
<tr>
<th>Body System</th>
<th>Function</th>
<th>Body's Response Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Endocrine Glands

I found this information on page __________.

Sequence the events that occur when a gland produces a hormone and sends it to a target tissue.

I found this information on page __________.

Distinguish the four main functions of the endocrine glands by completing the graphic organizer below.

Functions of the Endocrine Glands
**Main Idea**

**A Negative Feedback System**

*I found this information on page ________.*

**Details**

Model a negative-feedback system by completing the cycle chart below.

- **A meal is eaten.**

- Intestines take in ________, during ________.

- ________ level decreases to normal level in bloodstream.

- ________ is restored.

- ________ is released into bloodstream, causing the ________ and other tissues to take up more ________.

- ________ level in ________ increases.

- ________ responds to ________ level by producing the hormone ________.

**CONNECT IT**

Draw an outline of the human body on a separate sheet of paper. Label it *male or female*. Using information provided in your book, show where endocrine glands are located and then describe their functions.
Regulation and Reproduction
Section 2 The Reproductive System

**Predict** three things that might be discussed in Section 2 as you read the headings.

1. 
2. 
3. 

**Define** cilia as it relates to this section.

**Identify the vocabulary terms that match the definitions.**

- male organ that produces sperm and testosterone
- male reproductive cells
- mixture of sperm and a fluid that helps sperm move and supplies the sperm with an energy source
- in humans, female reproductive organ that produces eggs
- monthly release of an egg from an ovary in a hormone-controlled process
- hollow, pear-shaped, muscular organ in which a fertilized egg develops
- monthly flow of blood and tissue cells that occurs when the lining of the uterus breaks down and is shed

**Define** respond using its scientific meaning. Write a sentence that reflects this meaning.
Complete the graphic organizers below to differentiate the role of the pituitary gland in females and males.

**Pituitary Gland in Females**
- produces:
- stimulates:

**Pituitary Gland in Males**
- produces:
- stimulates:

Summarize information about the male reproductive organs in the graphic organizer below.
Describe how the menstrual cycle would differ in phase 3 if the egg were fertilized. Then infer how future cycles would be affected.

**Connect It**

*Sequence the steps through which an egg moves in the female reproductive system.*

*Analyze the phases of the menstrual cycle, and then complete the chart below.*

<table>
<thead>
<tr>
<th>Description</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td></td>
</tr>
<tr>
<td>Phase 2</td>
<td></td>
</tr>
<tr>
<td>Phase 3 (if fertilized egg does not arrive)</td>
<td></td>
</tr>
</tbody>
</table>
Skim the headings in Section 3. Then write three questions that you have about human life stages.

1. ______________________________________________________
2. ______________________________________________________
3. ______________________________________________________

**Define** nutrient to show its scientific meaning.

- nutrient

**Define** amniotic sac to show its scientific meaning.

- amniotic sac

**Define** fetus stress to show its scientific meaning.

- fetus stress

**Define** capable to show its scientific meaning.

- capable

**Define** embryo to show its scientific meaning.

- embryo

**Define** fetus to show its scientific meaning.

- fetus
Main Idea

Fertilization

Sequence the events that result in the formation of a zygote by completing the following graphic organizer.

- Sperm enter the vagina and come in contact with chemical secretions in the vagina.

- Two eggs are released and both are fertilized.

- A fertilized zygote divides into two separate zygotes.

- Twins of the same sex are born.

- Twins with different sexes are born.

Details

Classify the following descriptions as applying to either identical twins or fraternal twins. Write either for a description that could fit both categories.

- Two eggs are released and both are fertilized.

- A fertilized zygote divides into two separate zygotes.

- Twins of the same sex are born.

- Twins with different sexes are born.

Multiple Births

I found this information on page __________.

Development

Before Birth

Create a time line to indicate when the following events occur:

- a) embryo forms;
- b) amniotic sac forms;
- c) head forms;
- d) fingers and toes form.

Not all weeks will be filled in.

Weeks of Pregnancy
The Birthing Process

Sequence the events that occur during the birthing process. The first one has been completed for you.

1. Contractions increase.
2.
3.
4.
5.

Summarize information about the stages after birth using the chart below.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Period in Life</th>
<th>Changes That Occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infancy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Childhood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adulthood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Older Adulthood</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Synthesize It

Create a journal that reflects your own stages of development. Interview your parents to record information about your size at various ages (including birth weight and length) and when you learned certain skills such as the ability to crawl and walk, when you lost your baby teeth, and so on. Try to find pictures of yourself at various ages to include in your journal.
Regulation and Reproduction

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 with these.

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

<table>
<thead>
<tr>
<th>Regulation and Reproduction</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Endocrine glands are tissues that produce hormones.</td>
<td></td>
</tr>
<tr>
<td>• Testosterone is the male sex hormone and sperm is the male reproductive cell.</td>
<td></td>
</tr>
<tr>
<td>• Identical twins are not always the same sex.</td>
<td></td>
</tr>
<tr>
<td>• Adulthood is the final stage of human development.</td>
<td></td>
</tr>
</tbody>
</table>

Review

Use this checklist to help you study.

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☐ Study the definitions of vocabulary words.
☐ Review daily homework assignments.
☐ Re-read the chapter and review the charts, graphs, and illustrations.
☐ Review the Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

Summarize It

Explain how the title “Regulation and Reproduction” fits with the content of this chapter.
Plants

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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>• In tropical rain forests, there are more than 260,000 known plant species and probably more to be identified.</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>• Ferns and mosses produce spores rather than seeds.</td>
<td></td>
</tr>
<tr>
<td>• Paper and clothing are made from seed plants.</td>
<td></td>
</tr>
</tbody>
</table>

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

Write three characteristics that you think all plants have in common.
Plants
Section 1 An Overview of Plants

**Skim** the headings in Section 1. Then predict three facts you will learn from reading the section.

1. 
2. 
3. 

**Define** the word species. Use your book or a dictionary for help.

**species**

**Use your book to define the following key terms.**

**cuticle**

**cellulose**

**vascular plant**

**nonvascular plant**

**Use a dictionary to define adapt to reflect its scientific meaning.**

**adapt**
Section 1  An Overview of Plants (continued)

**Main Idea**

**What is a plant?**

I found this information on page __________.

**Details**

**Summarize** how plants make food by completing the concept map below. Use these terms: photosynthesis, chlorophyll, chloroplasts.

Green plant cells

contain

that make food through the process of

**Origin and Evolution of Plants**

I found this information on page __________.

**Sequence** the events in the table below. Write the oldest event at the bottom of the table and the youngest event at the top of the table.

**Events**

- First cone-bearing plants
- First flowering plants
- First green algae
- First land plants

(Youngest)  (Oldest)
Summarize how land plants made life possible for land animals.

Identify the four adaptations that make it possible for plants to live on land.

Complete the concept map below about plant classification.

Classification of plants
- divides plants into two major groups called
- was developed by
- gives each plant species its own

Connect It
Suppose that you are working at a greenhouse. While at work, a child asks you, “What’s a plant?” Write a short answer to this question.
Plants
Section 2 Seedless Plants

Skim Section 2 of your book. Then write three questions that you have about plants. Try to answer your questions as you read.

1. 
2. 
3. 

Define spore. Use your book or a dictionary for help. Write a sentence that reflects its scientific meaning.

spore

Use your book to define the following key terms. Then use each word in a sentence that reflects its scientific meaning.

rhizoid

pioneer species

Use a dictionary to define soil. Write a sentence that reflects its scientific meaning.

soil
Seedless Nonvascular Plants

Organize the characteristics of seedless nonvascular plants by completing the chart below.

<table>
<thead>
<tr>
<th>Characteristics of Seedless Nonvascular Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
</tr>
<tr>
<td>7.</td>
</tr>
<tr>
<td>8.</td>
</tr>
</tbody>
</table>

Complete the concept map to identify examples and characteristics of seedless nonvascular plants. One example has been listed for you.

Mosses
- spores in caps on stalks

Liverworts
- less than 2.5 cm in diameter
Importance of Seedless Plants

I found this information on page ___________.

Main Idea

Seedless Vascular Plants

I found this information on page ___________.

Details

Compare and contrast seedless vascular plants with seedless nonvascular plants in the Venn diagram below.

Seedless vascular plants

Seedless nonvascular plants

Both

Summarize the importance of seedless plants in the table below.

<table>
<thead>
<tr>
<th>Importance of Seedless Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
</tr>
<tr>
<td>7.</td>
</tr>
</tbody>
</table>

CONNECT IT

Suppose you are a naturalist working in a forest area that has recently burned in a forest fire. Summarize what you would tell visitors about seedless plants and how important they are to the forest’s recovery.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Scan Section 3 of your book. Write three questions that come to mind as you read the headings and examine the illustrations.

1. _____________________________________________________________________

2. _____________________________________________________________________

3. _____________________________________________________________________

Define seed. Use your book or a dictionary for help. Then use this word in a sentence that reflects its scientific meaning.

________________________________________________________________________

________________________________________________________________________

Read the definitions below. Write the correct key term on the blank in the left column. Use your book for help.

a vascular plant that produces seeds that are not protected by fruit

a vascular plant that flowers and produces fruit with one or more seeds

a plant with one cotyledon inside its seeds

a plant with two cotyledons inside its seeds

Use a dictionary to define annual as it applies to the length of a plant’s life.

________________________________________________________________________

________________________________________________________________________
Main Idea

Characteristics of Seed Plants

I found this information on page __________.

Details

Create a cross-section of a leaf in the space below. Label and describe the purpose of six important features.

I found this information on page __________.

Organize the characteristics of seed plants by completing the chart below.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaves</td>
<td></td>
</tr>
<tr>
<td>Stems</td>
<td></td>
</tr>
<tr>
<td>Roots</td>
<td></td>
</tr>
<tr>
<td>Vascular tissue</td>
<td></td>
</tr>
</tbody>
</table>
### Gymnosperms

**Main Idea**

Gymnosperms

I found this information on page __________.

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Complete the chart below about gymnosperms by writing about the characteristic listed in that cell.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gymnosperms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divisions</td>
</tr>
<tr>
<td>Flowers</td>
</tr>
</tbody>
</table>

### Angiosperms

**Main Idea**

Angiosperms

I found this information on page __________.

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Complete the chart below about angiosperms by writing about the characteristic listed in that cell.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Angiosperms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division</td>
</tr>
<tr>
<td>Flowers</td>
</tr>
</tbody>
</table>

### Importance of Seed Plants

**Main Idea**

Importance of Seed Plants

I found this information on page __________.

**Skim your book for two uses each of gymnosperms and angiosperms.**

**Gymnosperms:**
1. 
2. 

**Angiosperms:**
1. 
2. 
Tie It Together

Synthesize

_in the space below, draw a sketch of a tree. Label the tree’s roots, trunk, and leaves. Next to each label, write the important functions that each of these structures performs. Beneath your sketch, explain why trees are an important part of the environment._
Plants  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 with these.

1. Write an A if you agree with the statement.
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<table>
<thead>
<tr>
<th>Plants</th>
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☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three things that you have learned about plants.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Interactions of Living Things

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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Interactions of Living Things</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Both living and nonliving factors affect the organisms in an ecosystem.</td>
</tr>
<tr>
<td></td>
<td>• Some environments have no limiting factors.</td>
</tr>
<tr>
<td></td>
<td>• Organisms interact only with other members of their species.</td>
</tr>
<tr>
<td></td>
<td>• Energy flows from an organism that is being eaten to the organism that is eating.</td>
</tr>
</tbody>
</table>

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

Write a list of things you interact with each day.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Interactions of Living Things
Section 1 The Environment

Skim through Section 1 of your book. Write three questions that come to mind from reading the headings and examining the illustrations.

1. 
2. 
3. 

Define climate to show its scientific meaning.

climate

Use your book to identify the terms. Write the correct term in front of its definition.

study of all of the interactions among organisms and their environment
nonliving part of the environment
living part of the environment
all members of one species that live in the same area at the same time
group of populations that interact with one another in a given area
the biotic community in a given area and the abiotic factors that affect it
part of Earth that supports life—the top part of Earth’s crust, all of the waters covering Earth’s surface, and the surrounding atmosphere

Use a dictionary to define interact.
Section 1 The Environment (continued)

Main Idea

Ecology

I found this information on page _________.

Abiotic Factors

I found this information on page _________.

Details

Organize the factors in the environment that influence organisms by completing the graphic organizer below.

Factors in the Environment

nonliving

Summarize why the five abiotic factors are important to organisms in a particular environment.

<table>
<thead>
<tr>
<th>Abiotic Factor</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td></td>
</tr>
<tr>
<td>Sunlight</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td>Air</td>
<td></td>
</tr>
<tr>
<td>Soil</td>
<td></td>
</tr>
</tbody>
</table>
**Main Idea**

**Biotic Factors**

I found this information on page _________.

**Details**

Complete the graphic organizer below to identify three other things that organisms depend on one another for.

![Graphic Organizer](image)

Sequence from smallest to largest the levels of organization in which organisms interact with one another and with abiotic factors.

<table>
<thead>
<tr>
<th>Smallest</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Largest</td>
<td></td>
</tr>
</tbody>
</table>

**SYNTHESIZE IT**

The living world also can be organized into smaller levels. Working backwards from organism, describe four smaller levels arranged from largest to smallest.
Interactions of Living Things
Section 2 Interactions Among Living Organisms

Predict three things that might be discussed in Section 2 as you read the headings.

1. 
2. 
3. 

Define coexistence to show its scientific meaning.

Use your book to identify the correct terms. Write them in the spaces provided.

number of individuals in a population that occupy a definite area

any biotic or abiotic factor that limits the number of individuals in a population

any close interaction among two or more different species

role of an organism in the ecosystem: including what it eats, how it interacts with other organisms, and how it gets its food

place where an organism lives

Use a dictionary to define estimate.
Main Idea

Characteristics of Populations

I found this information on page __________.

Details

Organize information about the characteristics of populations. Fill in the definitions in the graphic organizer.

Characteristics of Populations

- Size
- Density
- Spacing

Compare the terms limiting factor and carrying capacity.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limiting factor</td>
<td></td>
</tr>
<tr>
<td>Carrying capacity</td>
<td></td>
</tr>
</tbody>
</table>

Define biotic potential by filling in the missing words.

Biotic potential: The __________ rate at which a population __________ when there are no __________ or enemies, there is plenty of food and __________, and the weather is ideal.
Section 2 Interactions Among Living Organisms (continued)

Main Idea

Symbiosis and Other Interactions

I found this information on page __________.

Details

Distinguish the types of symbiotic relationships by completing the chart below.

<table>
<thead>
<tr>
<th>Symbiotic Relationship</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Both organisms benefit.</td>
</tr>
<tr>
<td>Commensalism</td>
<td>One organism benefits and the other is harmed.</td>
</tr>
</tbody>
</table>

I found this information on page __________.

Analyze how predators may cause a prey population to grow more healthy and stronger over several generations.

I found this information on page __________.

Summarize the difference between a habitat and a niche.

I found this information on page __________.

SYNTHESIZE IT

Compare disease with predation as a limiting factor for human populations.
Interactions of Living Things
Section 3 Matter and Energy

Scan the headings and illustrations of Section 3 to identify two cycles that will be discussed.
1. ____________________
2. ____________________

Define consumer. Then write a sentence using the term.
consumer

Use your book to define the following terms.
food chain

food web

water cycle

Use a dictionary to define transfer.
transfer
Complete a pond food chain such as the one shown in your book. Then describe what the arrows in the food chain show.

Aquatic plants → Insects → ________ → ________ → ________

Define what a food web is and summarize why it is a more complete model than a food chain.

Identify organisms for each level of an ecological pyramid. Write the name of the organism inside the correct level of the pyramid. Then, label each level as consisting of producers or consumers.
Complete the organizer about water cycle processes.

Water Cycle Processes

- Condensation
  - process in which a liquid changes to a gas
- process in which water droplets fall from the atmosphere back to Earth’s surface

Model the carbon cycle in the space below. You may draw any picture that shows how carbon moves among the atmosphere, organisms, and solid Earth.

CONNECT IT
Describe two ways in which you are a part of the carbon cycle.

I found this information on page ________.

I found this information on page ________.
Tie It Together

Synthesize It

Create a food web.

1. Make a list of foods that you ate yesterday.
2. Determine whether the main component of each food was a producer or a consumer.
3. For each consumer, identify at least one food that it ate.
4. Then, create a food web that includes yourself.
Interactions of Living Things
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 with these.

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

<table>
<thead>
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<th>Interactions of Living Things</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
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<td>• Energy flows from an organism that is being eaten to the organism that is eating.</td>
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☐ Review the Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT
After reading this chapter, identify three things that you have learned about interactions of living things.

__________________________________________
__________________________________________
__________________________________________
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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Conserving Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• There is an unlimited supply of fossil fuels.</td>
</tr>
<tr>
<td></td>
<td>• Sun, wind, and heat within Earth’s crust can be used to generate power.</td>
</tr>
<tr>
<td></td>
<td>• Acid precipitation washes nutrients from the soil.</td>
</tr>
<tr>
<td></td>
<td>• The ozone layer emits radiation that can harm living cells.</td>
</tr>
</tbody>
</table>

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

List some resources, other than water, air, and fossil fuels, that we depend on and describe how we use them.

__________________________
__________________________
__________________________
__________________________
__________________________
__________________________
Conserving Resources
Section 1 Resources

**Predict** the topics that will be discussed in Section 1 after reading the headings and looking at the illustrations.

1. 
2. 
3. 

**Review Vocabulary**

**Define** *geyser* to show its scientific meaning.

*geyser*

**New Vocabulary**

**Define** the following terms to show their scientific meanings.

*natural resource*  
*hydroelectric power*  
*nuclear energy*  
*geothermal energy*  

**Academic Vocabulary**

**Define** *modify*. Then use it in an original sentence to show its scientific meaning.

*modify*
Compare renewable and nonrenewable resources by completing the chart below.

<table>
<thead>
<tr>
<th>Type of Resource</th>
<th>Description</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonrenewable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Organize information about fossil fuels in the concept web below.

How They Form

Fossil Fuels

Examples

Uses
Summarize three reasons that fossil fuels need to be conserved.

1. 
2. 
3. 

Organize information about alternative energy resources below.

<table>
<thead>
<tr>
<th>Alternative Energy Resource</th>
<th>Important Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydroelectric power</td>
<td></td>
</tr>
<tr>
<td>Wind energy</td>
<td></td>
</tr>
<tr>
<td>Geothermal energy</td>
<td></td>
</tr>
<tr>
<td>Nuclear power</td>
<td></td>
</tr>
<tr>
<td>Solar energy</td>
<td></td>
</tr>
</tbody>
</table>

Examine the circle graph in your book showing energy usage in the United States. Explain why so much of the United States’ energy comes from fossil fuels in spite of the fact that fossil fuels cause pollution and are limited in supply.
Conserving Resources
Section 2 Pollution

**Skim** the headings of Section 2 to determine three main types of pollution that will be discussed.

1. ___________________________________________________________________
2. ___________________________________________________________________
3. ___________________________________________________________________

**Define** atmosphere to show its scientific meaning.

**atmosphere**

________________________________________________________________________

________________________________________________________________________

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

substance that contaminates the environment

precipitation that has a pH below 5.6

trapping of heat from the Sun by Earth’s atmosphere

waste materials that are harmful to human health or poisonous to living organisms

**Define** affect to show its scientific meaning.

**affect**

________________________________________________________________________

________________________________________________________________________
**Main Idea**

**Acid Precipitation**

I found this information on page _________.

**Greenhouse Effect and Ozone Depletion**

I found this information on page _________.

**Details**

**Complete** the graphic organizer below to identify the effects of acid rain and ways to prevent acid rain.

![Graphic Organizer for Acid Rain]

**Sequence** the events that cause the greenhouse effect and ozone depletion by completing the following graphic organizers.

**Greenhouse Effect**

Fossil fuels are burned.

**Ozone Depletion**

CFCs are used in cooling systems.
Compare and contrast carbon monoxide and radon as sources of indoor air pollution by completing the following chart.

<table>
<thead>
<tr>
<th>Gas</th>
<th>Source</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon monoxide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radon</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Identify causes of the following three examples of water pollution.

1. Surface water pollution:  
   2. Ocean water pollution:  
   3. Groundwater pollution:  

Analyze causes of soil loss and soil pollution.

A. Causes of soil loss
   1.  
   2.  

B. Causes of soil pollution
   1.  
   2.  

CONNECT IT Explain in one sentence why people are concerned about pollution.  

__________________________________________________________________________  

__________________________________________________________________________  

__________________________________________________________________________  

__________________________________________________________________________
Conserving Resources
Section 3 The Three Rs of Conservation

Scan the headings of Section 3. List the three Rs of conservation below.

1. 
2. 
3. 

Define the following terms. Then write a paragraph that includes the scientific meaning of all three terms.

reprocessing

recycling

participate

Paragraph:
Main Idea

Conservation
I found this information on page ___________.

Reduce
I found this information on page ___________.

Reuse
I found this information on page ___________.

Details

Identify reasons for conserving resources by completing the graphic organizer below.

Reasons to Conserve Resources

Summarize four ways to reduce your own use of natural resources.

1. ________________________________
2. ________________________________
3. ________________________________
4. ________________________________

Define reusing an item. Then identify at least two examples of ways to reuse items.

Definition: ________________________________

Examples: ________________________________

_______________________________

_______________________________
**Main Idea**

**Recycle**

I found this information on page _________.

**Details**

**Summarize** recycling in the following chart.

<table>
<thead>
<tr>
<th>Recycling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
</tr>
<tr>
<td>Items that can be recycled</td>
</tr>
<tr>
<td>Advantages of recycling</td>
</tr>
<tr>
<td>How recycling is done</td>
</tr>
</tbody>
</table>

**Analyze** the graph that describes the recycling rates of key household items. Then complete the statements.

The percentages of ______________, ______________, and ______________ being recycled increased from 1990 to 2000.

The percentages of ______________, ______________, and ______________ being recycled decreased from 1995 to 2000.

**SYNTHESIZE IT**

In a small group, discuss why some people do not recycle. Summarize your discussion in the space below.

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________
Tie It Together

Conservation

Brainstorm ways to increase the level of conservation practiced in your school. Set a conservation, reuse, or recycling goal. Write a plan to change the school’s behavior to meet your goal. If new resources would be needed to implement your plan, hypothesize how you could raise money for what you need.

• Decide which method of conservation you are most concerned about.
• Describe the benefits of practicing that method of conservation in your school.
• Identify practical ways that students can practice conservation.
Conserving Resources  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 with these.

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

<table>
<thead>
<tr>
<th>Conserving Resources</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• There is an unlimited supply of fossil fuels.</td>
<td></td>
</tr>
<tr>
<td>• Sun, wind, and heat within Earth’s crust can be used to generate power.</td>
<td></td>
</tr>
<tr>
<td>• Acid precipitation washes nutrients from the soil.</td>
<td></td>
</tr>
<tr>
<td>• The ozone layer emits radiation that can harm living cells.</td>
<td></td>
</tr>
</tbody>
</table>

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 Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three new ways you could practice conservation.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

232  Conserving Resources
Properties and Changes of Matter

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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Properties and Changes of Matter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Melting and freezing are physical properties.</td>
</tr>
<tr>
<td></td>
<td>• Color, density, and solubility change depending on the amount of material.</td>
</tr>
<tr>
<td></td>
<td>• Exploding fireworks are examples of a chemical change.</td>
</tr>
<tr>
<td></td>
<td>• When a substance undergoes a physical change, its identity remains the same.</td>
</tr>
</tbody>
</table>

FOLDABLES

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

Science Journal

Think about what happens when you crack a glow stick. What types of changes are you observing?

________________________
________________________
________________________
________________________
________________________
________________________
Properties and Changes of Matter
Section 1 Physical and Chemical Properties

Scan the list below to preview Section 1 of your book.
• Read all section headings.
• Read all bold words.
• Read all charts and graphs.
• Think about what you already know about matter.

Write three facts you discovered about physical and chemical properties of matter as you scanned this section.
1. ________________________________________________________
2. ________________________________________________________
3. ________________________________________________________

Define matter to show its scientific meaning and then use the term in an original sentence.
________________________________________________________
________________________________________________________
________________________________________________________

Use your book to define the following terms.

physical property
________________________________________________________
________________________________________________________
________________________________________________________

chemical property
________________________________________________________
________________________________________________________
________________________________________________________

Use a dictionary to define differentiate to show its scientific meaning.
________________________________________________________
________________________________________________________

234  Properties and Changes of Matter
Organize information about physical properties of matter in the graphic organizer. Identify and describe each property.

**Size-Dependent Properties**

- volume: the amount of space in an object

**Size-Independent Properties**
Section 1 Physical and Chemical Properties (continued)

Main Idea

**Physical Properties**

Distinguish substances by their physical properties. Use the chart in your book to identify each substance below.

<table>
<thead>
<tr>
<th>Substance</th>
<th>State</th>
<th>Density (g/cm³)</th>
<th>Melting Point (°C)</th>
<th>Boiling Point (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>liquid</td>
<td>3.12</td>
<td>−7.0</td>
<td>59.0</td>
</tr>
<tr>
<td></td>
<td>solid</td>
<td>4.93</td>
<td>113.5</td>
<td>184.0</td>
</tr>
<tr>
<td></td>
<td>solid</td>
<td>2.044</td>
<td>360</td>
<td>1,322.0</td>
</tr>
<tr>
<td></td>
<td>liquid</td>
<td>1.0</td>
<td>0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Chemical Properties**

Summarize chemical properties by completing the concept map.

CONNECT IT

Suppose that you were given a sample of an unknown liquid substance. Which physical properties would be easiest to identify? Which would be most difficult? Support your reasoning with specific examples.
### Properties and Changes of Matter

#### Section 2 Physical and Chemical Changes

**Review Vocabulary**

**Define** solubility to show its scientific meaning.

**solubility**

<table>
<thead>
<tr>
<th>1.</th>
<th>2.</th>
<th>3.</th>
</tr>
</thead>
</table>

**New Vocabulary**

Use your book to define the following terms. Then use the term in a sentence.

- **vaporization**

<table>
<thead>
<tr>
<th>1.</th>
<th>2.</th>
<th>3.</th>
</tr>
</thead>
</table>

- **sublimation**

<table>
<thead>
<tr>
<th>1.</th>
<th>2.</th>
<th>3.</th>
</tr>
</thead>
</table>

- **deposition**

<table>
<thead>
<tr>
<th>1.</th>
<th>2.</th>
<th>3.</th>
</tr>
</thead>
</table>

**Academic Vocabulary**

Use a dictionary to define undergo. Then use the term in a sentence to show its scientific meaning.

**undergo**

<table>
<thead>
<tr>
<th>1.</th>
</tr>
</thead>
</table>

---

**Name** ____________________________  **Date** ____________
### Physical Changes

I found this information on page ___________.

### Chemical Changes

I found this information on page ___________.

#### Main Idea

**Physical Changes**

**Chemical Changes**

### Complete the table about two physical changes.

<table>
<thead>
<tr>
<th>Physical Change</th>
<th>What Happens</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing shape</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissolving</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Distinguish four types of changes of state. Define each type of change, and give an example.

<table>
<thead>
<tr>
<th>Type and Definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Summarize how a chemical change is different from a physical change. Complete the paragraph.

In a physical change, __________________________ changes, but __________________________ does not. In a chemical change, __________________________.

Rusting is one example of a __________________________ in which __________________________ react with __________________________ to form __________________________.
Main Idea

Signs of Chemical Changes

Identify five signs of chemical change.
1. 
2. 
3. 
4. 
5. 

Chemical Versus Physical Change

Classify each of the following events as a physical change or a chemical change.

1. A tree is cut into lumber.
2. Copper is bent.
3. Marble dissolves in acid rain.
4. Wood is burned.

Conservation of Mass

Analyze how conservation of mass applies to a burning candle.

EVALUATE IT

A glass of water is placed on a very sensitive scale and several antacid tablets are dropped into the water. The weight of the glass and its contents is less after the tablets dissolve than before the tablets dissolved. Explain how matter is conserved in this example.

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________
After reading this chapter, identify three main ideas you have learned about properties and changes of matter.
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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Substances, Mixtures, and Solubility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Burning a substance changes it into other substances.</td>
</tr>
<tr>
<td></td>
<td>• All mixtures are solutions.</td>
</tr>
<tr>
<td></td>
<td>• Stirring can speed up the rate at which a substance dissolves.</td>
</tr>
<tr>
<td></td>
<td>• Acidic foods are sour.</td>
</tr>
</tbody>
</table>

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

*Science Journal*

*Find and name four items around you that are mixtures.*

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 

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Substances, Mixtures, and Solubility
Section 1 What is a solution?

**Read** the What You’ll Learn statements for Section 1. Write four questions you have after reading the statements.

1. 
2. 
3. 
4. 

**Define** proton to show its scientific meaning.

**Write the correct vocabulary word in the left column next to each definition.**

- solid that comes out of its solution due to a chemical reaction
- matter with the same composition and properties throughout
- substance that dissolves a solute
- mixture in which substances are not evenly mixed
- mixture with two or more substances that are evenly mixed
- substance that dissolves and seems to disappear into another substance
- another name for a homogeneous mixture

**Use a dictionary to define proportion to show its scientific meaning.**
Section 1 What is a solution? (continued)

Main Idea

Substances

I found this information on page ____________.

Compare elements and compounds by completing the chart.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element</td>
<td></td>
</tr>
<tr>
<td>Compound</td>
<td></td>
</tr>
</tbody>
</table>

Contrast physical and chemical processes. Complete the sentences.

Physical processes ________ change substances.

Chemical processes ________ change substances.

Mixtures

I found this information on page ____________.

Distinguish heterogeneous and homogeneous mixtures. Place the phrases in the Venn diagram.

- not bonded chemically
- not evenly mixed
- evenly mixed
- can be physically separated
- also known as solutions

Heterogeneous Homogeneous

Both

How Solutions Form

I found this information on page ____________.

Summarize how solutions form. Define solute and solvent in your answer.

_____________________

_____________________

_____________________

_____________________

_____________________

_____________________

_____________________

_____________________

Substances, Mixtures, and Solubility 243
Section 1 What is a solution? (continued)

Main Idea

Contrast crystallization and precipitate formation.

Crystallization: ________________________________

Precipitate formation: __________________________

Organize examples of each type of solution.

Identify the solvent and solute(s) for each solution.

The air you breathe: ________________________________

Brass: ________________________________

CONNECT IT

A jar of ocean water sits on a shelf uncovered for some time. Once the water is gone, a white, salty substance is left in the jar. Hypothesize what kind of change occurred. What does this tell you about the water?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
**Substances, Mixtures, and Solubility**

**Section 2: Solubility**

---

**Scan** the headings, bold words, and illustrations in Section 2. Write two facts you learned as you scanned the section.

1. 
2. 

**Review Vocabulary**

**Define** polar bond.

<table>
<thead>
<tr>
<th>polar bond</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**New Vocabulary**

Write a scientific definition for each vocabulary term.

- **aqueous**
- **solubility**
- **saturated**
- **concentration**

**Academic Vocabulary**

Use a dictionary to define chemical as an adjective.

<table>
<thead>
<tr>
<th>chemical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
Main Idea

Water—The Universal Solvent

I found this information on page __________.

Details

Model and label a water molecule, including:

- the shared electrons in the bonds
- the partial positive and partial negative charge areas
- the hydrogen and oxygen atoms

Contrast the ways in which ionic and polar molecular compounds dissolve in water. Complete the chart.

<table>
<thead>
<tr>
<th>Type of Compound</th>
<th>How It Dissolves in Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ionic</td>
<td></td>
</tr>
<tr>
<td>Polar molecular</td>
<td></td>
</tr>
</tbody>
</table>

What will dissolve?

I found this information on page __________.

Analyze the phrase “like dissolves like.” Summarize what this phrase means in your own words.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Main Idea

How much will dissolve?

I found this information on page __________.

Details

Summarize how temperature affects solubility.

As temperature increases, the solubility of liquid-solid solutions usually __________ and the solubility of liquid-gas solutions usually __________.

Describe a saturated solution and tell how a solution can become supersaturated.

Identify three ways the rate of dissolving can be increased.

1. __________
2. __________
3. __________

Summarize how adding solute changes the properties of a solvent.

Section 2 Solubility (continued)

Rate of Dissolving

I found this information on page __________.

Concentration

I found this information on page __________.

SUMMARIZE IT

A chef slowly stirs sugar into a pot of water. Describe what happens to the solution as the water heats. What can you conclude about how long it will take the solution to boil?

NAME ___________________________________________ DATE ____________

Substances, Mixtures, and Solubility 247
Substances, Mixtures, and Solubility
Section 3 Acidic and Basic Solutions

**Predict** three topics you expect to be discussed in Section 3. Read the headings and bold words to help make your prediction.

1. __________________________________________
2. __________________________________________
3. __________________________________________

**Define** physical property using your book or a dictionary.

**physical property**

_________________________________________

_________________________________________

**New Vocabulary** Write an original sentence using each vocabulary term.

**neutralization**

_________________________________________

_________________________________________

**pH**

_________________________________________

**hydronium ion**

_________________________________________

**base**

_________________________________________

**indicator**

_________________________________________

**acid**

_________________________________________

**Academic Vocabulary** Use a dictionary to define conduct as a verb in its scientific sense.

**conduct**

_________________________________________
Section 3 Acidic and Basic Solutions (continued)

Main Idea

**Acids**

I found this information on page __________.

**Bases**

I found this information on page __________.

Details

Model and label the formation of a hydronium ion from a hydrogen ion in water.

Write a sentence explaining how hydronium forms from an acid.

Organize information about the properties of acids and some examples of acids. Complete the diagram.

<table>
<thead>
<tr>
<th>Properties</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
<td>4.</td>
</tr>
</tbody>
</table>

Organize properties and examples of bases. Complete the diagram.

<table>
<thead>
<tr>
<th>Properties</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
<td>5.</td>
</tr>
<tr>
<td>6.</td>
<td>6.</td>
</tr>
</tbody>
</table>
Heartburn is caused by excess acid in the digestive system. Antacid tablets treat heartburn by neutralizing the acid. Explain what you can conclude about the tablets, and why.

CONNECT IT

Heartburn is caused by excess acid in the digestive system. Antacid tablets treat heartburn by neutralizing the acid. Explain what you can conclude about the tablets, and why.

---

Section 3 Acidic and Basic Solutions (continued)

**Main Idea**

**What is pH?**

I found this information on page ________.

**Details**

Label the diagram of the pH scale. Label the areas of the scale for acids, bases, and neutral solutions. Draw arrows showing how the strength of acids and bases increases.

![Pictograph of pH scale]

**Indicators**

I found this information on page ________.

**Neutralization**

I found this information on page ________.

**Summarize** what determines the strength of acidic and basic solutions.

**Describe** the response of the indicator litmus paper in each case.

When placed in acid, litmus paper _________________.

When placed in base, litmus paper _________________.

**Complete** the cause-and-effect chart about neutralization.

<table>
<thead>
<tr>
<th>Step</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The pH of the solution becomes more neutral.</td>
</tr>
</tbody>
</table>

---

**CONNECT IT**

Heartburn is caused by excess acid in the digestive system. Antacid tablets treat heartburn by neutralizing the acid. Explain what you can conclude about the tablets, and why.

---

250  Substances, Mixtures, and Solubility
Tie It Together

Can You Guess?

Write clues that a classmate could use to guess three substances or mixtures from everyday life. Include information about the properties and uses of the substance or mixture.

For example, if you chose vinegar, you might write:

“This is a liquid-liquid solution. It is a weak acid. It is used on salads and in other foods.”

Trade clues with a classmate and try to guess each other’s items.

1. 

2. 

3. 

Name __________________________ Date ______________
Substances, Mixtures, and Solubility
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 with these.

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

<table>
<thead>
<tr>
<th>Substances, Mixtures, and Solubility</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Burning a substance changes it into other substances.</td>
<td></td>
</tr>
<tr>
<td>• All mixtures are solutions.</td>
<td></td>
</tr>
<tr>
<td>• Stirring can speed up the rate at which a substance dissolves.</td>
<td></td>
</tr>
<tr>
<td>• Acidic foods are sour.</td>
<td></td>
</tr>
</tbody>
</table>

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 Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three things that you have learned that surprised you.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

252 Substances, Mixtures, and Solubility
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.

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>States of Matter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• There are four states of matter.</td>
</tr>
<tr>
<td></td>
<td>• Solids take the shape of their containers.</td>
</tr>
<tr>
<td></td>
<td>• Substances cannot change directly from a solid to a gas.</td>
</tr>
<tr>
<td></td>
<td>• The air around you is putting pressure on your body.</td>
</tr>
</tbody>
</table>

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

*Science Journal*

Write about what you predict is a source of the warm water in a hot natural spring in a cold, snowy climate.
Skim through Section 1 of your text. Write three questions that come to mind when reading the headings and looking at the illustrations.

1. 

2. 

3. 

Define the word *atom* in a scientific sentence.

Write the correct vocabulary term next to each definition.

- matter that does not have a definite shape or volume
- anything that takes up space and has mass
- matter with a definite shape and volume
- liquid’s resistance to flow
- uneven forces acting on the particles on the surface of a liquid
- matter with a definite volume but no definite shape

Use a dictionary to define *definite*.
Define matter, and identify the four states of matter.

Matter:

The Four States of Matter

Solids

Complete the statements about properties of solids.

Do solids have definite shape? ______
Do solids have definite volume? ______
Do solids take the shape of its container? ______
How do particles in solids move? ______________________
How are particles in crystalline solids arranged? ________________
How are particles in amorphous solids arranged? ________________

Contrast liquids with solids.

1. ______________________
2. ______________________
3. ______________________
Distinguish between viscosity and surface tension.

Gases

Organize information about gases.

Gases are made of particles that move to fill the space they occupy.

Do not have definite shape or volume.

Compare and contrast the motion of particles in a solid with those in a gas.
Predict three things that might be discussed in this section after reading the title and headings.

1. 
2. 
3. 

Define the word energy using a dictionary or your book.

energy

Write the correct vocabulary term next to each definition.

average kinetic energy of the particles in a substance
the change from a gas state to a liquid state
the change from a solid state to a liquid state
total kinetic energy of the particles in a material
the change from a liquid state to a gas state
the change from a liquid state to a solid state
movement of thermal energy from a substance at a higher temperature to one at a lower temperature

Use a dictionary to define item.
Main Idea

Thermal Energy and Heat

I found this information on page _________.

Details

**Classify each phrase to show whether it describes thermal energy, temperature, or both.**

- depends on the number of particles
- average energy of particles
- involves kinetic energy of particles
- total energy of particles

Create a drawing to show a glass of lemonade with ice cubes in it. Use arrows to show the movement of thermal energy.

Complete the chart below on specific heat.

<table>
<thead>
<tr>
<th></th>
<th>Cool</th>
<th>Heat</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substances with high specific heats</td>
<td>slowly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substances with low specific heats</td>
<td></td>
<td>quickly</td>
<td></td>
</tr>
</tbody>
</table>
Section 2 Matter Changes of State (continued)

Main Idea

Changes Between the Solid and Liquid States
I found this information on page ___________.

Changes Between the Liquid and Gas States
I found this information on page ___________.

Changes Between the Solid and Gas States
I found this information on page ___________.

Details

Compare the changes between the solid and liquid states by completing the chart.

<table>
<thead>
<tr>
<th>What is it?</th>
<th>Melting</th>
<th>Freezing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal energy released or absorbed?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Distinguish the changes between gas and liquid states by filling in the graphic organizer.

Summarize information about sublimation.

SYNTHESIZE IT
Explain the relationship between heat and temperature.
Scan  Section 3 of your book. Write three facts you discovered about fluids as you scanned the section.

1. ____________________________________________
2. ____________________________________________
3. ____________________________________________

Define the word force in a sentence to show its scientific meaning.

force

________________________________________________
________________________________________________

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

pressure

________________________________________________
________________________________________________

buoyant force

________________________________________________
________________________________________________

Archimedes’ principle

________________________________________________
________________________________________________

density

________________________________________________
________________________________________________

Pascal’s principle

________________________________________________
________________________________________________

Use a dictionary to define expand to show its scientific meaning.

expand

________________________________________________
Main Idea

Pressure

I found this information on page __________.

Details

Complete the formula for pressure. Then analyze how pressure changes with a change in force or area.

Pressure = ____________

<table>
<thead>
<tr>
<th>If force</th>
<th>and area</th>
<th>then pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>increases</td>
<td>stays the same</td>
<td></td>
</tr>
<tr>
<td>decreases</td>
<td>stays the same</td>
<td></td>
</tr>
<tr>
<td>stays the same</td>
<td>increases</td>
<td></td>
</tr>
<tr>
<td>stays the same</td>
<td>decreases</td>
<td></td>
</tr>
</tbody>
</table>

Define atmospheric pressure and describe why you do not feel it.

Analyze how the size of a weather balloon would change as it rises into the atmosphere. Create and label a drawing or write sentences to explain why the balloon changes size.
Complete the graphic organizer to show how changes in volume and temperature can increase pressure.

Pressure increases

as volume ___________

as temperature ___________

Compare the buoyancy of an object that is more dense than water with an object that is less dense than water. Draw and label arrows to show the buoyant force and weight of each.

More Dense

Less Dense

Summarize Pascal’s principle, and give an example that illustrates the principle.

An ice cube (solid water) floats in liquid water. Explain this in terms of density and buoyant force.
Tie It Together

Synthesize It

Describe a situation from daily life in which you have experienced each change of state identified below. Explain how thermal energy was involved in the change of state.

Condensation

__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________

Melting

__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________

Freezing

__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________
__________________________________________________________________________________________

Evaporation

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

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

<table>
<thead>
<tr>
<th>States of Matter</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• There are four states of matter.</td>
<td></td>
</tr>
<tr>
<td>• Solids take the shape of their containers.</td>
<td></td>
</tr>
<tr>
<td>• Substances cannot change directly from a solid to a gas.</td>
<td></td>
</tr>
<tr>
<td>• The air around you is putting pressure on your body.</td>
<td></td>
</tr>
</tbody>
</table>

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 Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT
After reading this chapter, identify three things that you have learned about states of matter.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

264 States of Matter
Newton’s Laws of Motion

Before You Read

Preview the chapter and section titles and the section headings. Complete the two columns of the chart by listing at least two ideas for each section in each column.

<table>
<thead>
<tr>
<th>K What I know</th>
<th>W What I want to find out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Foldables Study Organizer**

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

**Science Journal**

List three questions that you would ask an astronaut about space flight.

---

List three questions that you would ask an astronaut about space flight.
Scan Section 1 of your book.

- Read all section titles.
- Read all bold words.
- Read all charts and graphs.
- Look at all the pictures and read their captions.
- Think about what you already know about motion.

Write two facts that you discovered about motion as you scanned the section.

1. 

2. 

Define meter in a sentence to show its scientific meaning.

Match the vocabulary term to the correct definition.

- distance and direction between starting and ending positions
- displacement divided by time
- distance divided by time
- change in velocity divided by the amount of time required for the change to occur

Use a dictionary to define initial.
Main Idea

What is motion?

Create an original drawing that shows the difference between distance and displacement. Then explain the difference between these terms in the spaces provided.

Details

Speed

Complete the mathematical equation to show how speed is calculated.

speed (in meters/second) = \frac{\text{__________ (in meters)}}{\text{__________ (in seconds)}}

OR

s = \text{__________}

Distinguish between speed, constant speed, and instantaneous speed.

Speed: \text{__________}

Constant speed: \text{__________}

Instantaneous speed: \text{__________}
Main Idea

Velocity
I found this information on page __________.

Organize information by placing each phrase in the Venn diagram.
- how fast displacement changes
- how fast distance changes
- rate of change

Acceleration
I found this information on page __________.

Complete the graphic organizer by listing the 2 factors that affect acceleration.

Acceleration is a change in ____________ and/or ____________.

Complete the equation to show how acceleration is calculated.

\[
\text{acceleration} = \frac{\text{distance}}{\text{time}} = \frac{\text{final velocity} - \text{initial velocity}}{\text{time}}
\]

OR

\[a = \quad \]

Connect It
Identify examples of when you may have used information about speed, distance, or displacement in your everyday life.

_______

_______

_______

_______

_______

_______
Newton’s Laws of Motion

Section 2 Newton’s First Law

**Predict** three things that might be discussed in this section after reading its headings.

1. 
2. 
3. 

**Define** mass to show its scientific meaning.

**Review Vocabulary**

*mass*

**New Vocabulary**

*force*

*first law of motion*

*balanced forces*

*unbalanced forces*

**Academic Vocabulary**

*individual*
**Main Idea**

**Laws of Motion**
I found this information on page __________.

**Newton’s First Law of Motion**
I found this information on page __________.

---

**Details**

Summarize forces *by completing the list below.*

1. A force is ________________.
2. Every force has ________________.
3. Every force has ________________.

Analyze information about forces *to complete the notes below.*

**Forces**

<table>
<thead>
<tr>
<th>I. A contact force is</th>
<th>________________</th>
<th>________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples:</td>
<td>________________</td>
<td>________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. A long-range force is</th>
<th>________________</th>
<th>________________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Examples:</td>
<td>________________</td>
<td>________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III. The SI unit of force is</th>
<th>________________</th>
</tr>
</thead>
</table>

Summarize *Newton’s first law of motion.*

---

Name ___________________________ Date _____________

Section 2 Newton’s First Law (continued)
Main Idea

Adding Forces

I found this information on page _________.

Details

Create one drawing in each box to show how objects are affected when acted on by balanced forces and unbalanced forces.

- Use arrows and labels to show the direction of the forces acting on the object and any motion that results.

Balanced Forces

Unbalanced Forces

Summarize It

A bowling ball and a tennis ball are rolling down a hill at the same speed. Infer which ball requires more force to stop its motion. Explain your reasoning.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Newton’s Laws of Motion

Section 3 Newton’s Second Law

**Analyze** the objectives listed under What You’ll Learn for this section. Change the statements into questions.

1. ______________________________________________________

2. ______________________________________________________

3. ______________________________________________________

**Define** solar system *in a sentence to show its scientific meaning.*

**New Vocabulary**

- solar system

**Define** the key terms using a dictionary or your book.

- second law of motion

- gravitational force

- friction

**Academic Vocabulary**

- principle

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

---

272  Newton’s Laws of Motion
Main Idea

The Second Law of Motion

I found this information on page __________.

Using the Second Law

I found this information on page __________.

Details

Summarize Newton’s second law of motion.

Complete the equation to show Newton’s second law of motion.

acceleration (in m/s²) = __________ (in N) __________ (in kg)

OR

a = __________

Analyze ways of using Newton’s second law by completing the chart.

<table>
<thead>
<tr>
<th>If you know an object’s</th>
<th>Calculate its</th>
<th>By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass and acceleration</td>
<td>force</td>
<td>multiplying its mass by its acceleration</td>
</tr>
<tr>
<td>Mass and force</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Force and acceleration</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Complete the graphic organizer by listing the 2 factors that affect gravitational force.

Gravitational force depends on __________ and
Distinguish between mass and weight as you complete the paragraph.

Mass is a measure of the _______ in an object. Weight is a measure of the _______ acting on an object. Unlike an object’s _______, an object’s _______ changes when the force of _______ changes.

Classify the four types of friction by completing the chart.

<table>
<thead>
<tr>
<th>Type of Friction</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static friction</td>
<td>keeps an object at rest from moving on a surface when a force is applied to the object</td>
<td>friction between a book and a sloping desktop on which the book is lying</td>
</tr>
<tr>
<td>Sliding friction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rolling friction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air resistance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Distinguish between different types of friction as you give a personal example of each type.

---

Section 3 Newton’s Second Law (continued)
Scan the section, and then write three facts that you discovered about Newton’s third law of motion.

1. 

2. 

3. 

Define contact force, and then use it in a sentence to show its scientific meaning.

Use your book to define the key term, and then use it in a sentence to show its scientific meaning.

third law of motion

Use a dictionary to define flexible to show its scientific meaning.
Section 4 Newton’s Third Law (continued)

Main Idea

The Third Law of Motion

I found this information on page _________.

Details

Summarize Newton’s third law of motion.

I found this information on page _________.

Model action and reaction forces.

• Use arrows to show action and reaction forces.
• Label the action force and the reaction force in your model.

Compare action and reaction forces with balanced forces by completing the Venn diagram below.

- Forces _______ cancel
- Forces _______ cancel
- Forces _______ act on
- Forces _______ act on
- Both
- Pushes or pulls

I found this information on page _________.

Applying the Third Law

I found this information on page _________.

Name ___________________________ Date ______________

276 Newton’s Laws of Motion
Section 4  Newton’s Third Law (continued)

Main Idea

Combining the Laws

I found this information on page _________.

Details

Create a drawing that shows a situation described by all three laws of motion.

- Use arrows to show the size and direction of the forces involved.
- Label your drawing to explain how each law of motion is demonstrated.

CONNECT IT

Provide an example from your everyday life of a situation described by Newton’s third law of motion. Identify the action and reaction forces in your example.

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________
Review the ideas you listed in the chart at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the chart by filling in the third column. Compare your previous answers with these.

<table>
<thead>
<tr>
<th>K</th>
<th>What I know</th>
<th>W</th>
<th>What I want to find out</th>
<th>L</th>
<th>What I learned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 Self Check at the end of each section.
☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT

After reading this chapter, identify three main concepts that you have learned about motion.

________________________

________________________

________________________

________________________
Energy and Energy Resources

Before You Read

Preview the chapter title, the section titles, and the section headings. List at least two ideas for each section in each column.

<table>
<thead>
<tr>
<th>K</th>
<th>What I know</th>
<th>W</th>
<th>What I want to find out</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Choose three devices that use electricity and identify the function of each device.

---

---

---
Energy and Energy Resources

Section 1  What is energy?

Analyze the objectives for Section 1. Write three questions you have. Look for responses to each question as you read the section.

1. __________________________________________________________
   __________________________________________________________
   __________________________________________________________

2. __________________________________________________________
   __________________________________________________________
   __________________________________________________________

3. __________________________________________________________
   __________________________________________________________
   __________________________________________________________

Define mass to show its scientific meaning.

mass

Read each definition below. Write the correct vocabulary term on the blank in the left column.

- energy in the nucleus of an atom
- ability to cause change
- energy stored in chemical bonds
- energy that an object has as a result of its motion
- current that comes out of batteries and wall sockets
- energy that increases with temperature
- energy that is stored because of an object’s position
- energy carried by light

Use a dictionary to define enormous.

enormous

__________________________________________________________

__________________________________________________________
Section 1 What is energy? (continued)

Main Idea

The Nature of Energy
I found this information on page ________.

Energy of Motion
I found this information on page ________.

Energy of Position
I found this information on page ________.

Details

Create a list of three examples of how energy causes changes that you observe in your classroom.

1. _______________________________________________________
2. _______________________________________________________
3. _______________________________________________________

Complete the graphic organizer by using information from your book to describe energy of motion.

Energy an object has as a result of its motion is _____________.

which increases or decreases with

Complete the graphic organizer by using information from your book to describe energy of position.

Energy an object has as a result of its position is _____________.

which increases or decreases with
Synthesize your knowledge of each form of energy by providing examples of them.

<table>
<thead>
<tr>
<th>Form of Energy</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal</td>
<td></td>
</tr>
<tr>
<td>Chemical</td>
<td></td>
</tr>
<tr>
<td>Radiant</td>
<td></td>
</tr>
<tr>
<td>Electrical</td>
<td></td>
</tr>
<tr>
<td>Nuclear</td>
<td></td>
</tr>
</tbody>
</table>

Connect It

Choose any three forms of energy discussed in this lesson. Explain how each form of energy is important in your daily life.
Preview Section 2 of your book using the checklist.

☐ Read all section headings.
☐ Read all bold words.
☐ Look at all of the pictures and read their labels.
☐ Think about what you already know about how energy changes form.

Write three facts you discovered about energy transformations as you scanned the section.

1. ____________________________
2. ____________________________
3. ____________________________

Define the vocabulary terms using your book.

transformation

law of conservation of energy

generator

turbine

Use a dictionary to define convert.
State the law of conservation of energy.

The law of conservation of energy states that

Model the potential and kinetic energy transformations that take place as a person tosses a ball into the air and then catches it.

- Label the points at which the ball has the greatest potential energy and the greatest kinetic energy.

Analyze the energy flow in a gasoline-powered engine and complete the diagram below.

---

<table>
<thead>
<tr>
<th>Main Idea</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Law of Conservation of Energy</strong></td>
<td>State the law of conservation of energy.</td>
</tr>
<tr>
<td>I found this information on page __________.</td>
<td>The law of conservation of energy states that _________________.</td>
</tr>
<tr>
<td><strong>Changing Kinetic and Potential Energy</strong></td>
<td>Model the potential and kinetic energy transformations that take place as a person tosses a ball into the air and then catches it.</td>
</tr>
<tr>
<td>I found this information on page __________.</td>
<td>- Label the points at which the ball has the greatest potential energy and the greatest kinetic energy.</td>
</tr>
<tr>
<td><strong>Energy Changes Form</strong></td>
<td>Analyze the energy flow in a gasoline-powered engine and complete the diagram below.</td>
</tr>
<tr>
<td>I found this information on page __________.</td>
<td></td>
</tr>
</tbody>
</table>

---

284 Energy and Energy Resources
Compare and contrast energy transformations that occur when electrical energy is generated in coal power plants with energy transformations that occur when energy is used to help you hear. Sequence steps in each process side-by-side.

<table>
<thead>
<tr>
<th>Coal Power Plants</th>
<th>Energy in Hearing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Contrast a turbine with a generator.

<table>
<thead>
<tr>
<th>Turbine</th>
<th>Generator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Synthesize it

Identify some points in the energy flow through a power plant that might produce unwanted forms of energy and make the plant less efficient.

---

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Energy and Energy Resources
Section 3 Sources of Energy

Predict what you will learn in this section. Read the title. Then write two topics that might be discussed.

1. ______________________________________________________________________
2. ______________________________________________________________________

Review Vocabulary
Write a sentence using the word resource that shows its scientific meaning.

resource

New Vocabulary
Define the key terms using your book or a dictionary.

nonrenewable resource

renewable resource

alternative resource

inexhaustible resource

photovoltaic

Academic Vocabulary
Use a dictionary to define percent.

percent
Main Idea

Energy Resources

I found this information on page _________.

Fossil Fuels, Nuclear Energy, and Hydroelectricity

I found this information on page _________.

Details

Identify two types of energy from the natural world that Earth’s surface receives.

1. ____________________________

   ____________________________

2. ____________________________

   ____________________________

Compare energy resources by completing the table.

<table>
<thead>
<tr>
<th>Energy Resources</th>
<th>Fossil Fuels</th>
<th>Nuclear</th>
<th>Hydroelectric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source of energy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renewable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advantages</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disadvantages</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Complete the concept map by listing four alternative sources of energy.

Identify two reasons to conserve fossil fuels.
1. ________________________________
2. ________________________________

List three specific things you can do to conserve fossil fuels.

______________________________

______________________________

______________________________
Tie It All Together

Energy and Energy Resources

Make a concept map that includes all of the ways energy can be generated that are mentioned in this chapter.

Now imagine you are an energy expert on a planning council for a new town to be built on an island. Evaluate resources and/or methods you will suggest that the new town use. Justify your choices and provide possible challenges to the project.
**Energy and Energy Resources**

**Chapter Wrap-Up**

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

<table>
<thead>
<tr>
<th>K What I know</th>
<th>W What I want to find out</th>
<th>L What I learned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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 Self Check at the end of each section.
- Look over the Chapter Review at the end of the chapter.

**Summarize It**

Summarize three main points of the chapter in a paragraph or by using a concept map.
accompany: to go together with; to happen at the same time as
accurate: careful and exact; without mistakes or errors
adapt: to change to fit new conditions
adjust: to arrange the parts of something to make it work correctly
affect: to make something happen; to have an effect on
annual: plant that completes its life cycle in one year
capable: able to do things; fit
category: a division in a classification system
chemical: having to do with or made by chemistry
chemical bond: the force holding atoms together in a molecule
clarify: to make easier to understand
code: (noun) set of signals representing letters or numerals, used to send a message; (verb) to put in the form of symbols
conduct: to carry or transmit
consist: to be made up of; to contain
constant: going on all the time; continual; persistent; regular; stable
contract: to become smaller in size
convert: to change from one form or use to another
coordinate: to cause to work well together
create: to bring about
cycle: a complete set of events or phenomena recurring in the same sequence
definite: clear, without a doubt
displace: to force to move from an original place
distribute: to divide among several or many
eliminate: to get rid of
enable: to make possible
enormous: very large
erode: to wear away
estimate: to determine the approximate value of something
expand: to get bigger
expert: person who is very skillful or highly trained and informed in some special field
facilitate: to make easy or easier
factor: a substance that functions in a body system
feature: a separate or special part or quality
flexible: able to bend without breaking
hypothesis: something that is suggested as being true for the purposes of argument or of further investigation
image: a picture produced by an optical or electronic device
individual: being or characteristic of a single thing
infer: to arrive at a conclusion or an opinion by reasoning
### Academic Vocabulary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>initial</strong>:</td>
<td>placed at the beginning; first</td>
</tr>
<tr>
<td><strong>insert</strong>:</td>
<td>to put or fit (something) into something else</td>
</tr>
<tr>
<td><strong>interact</strong>:</td>
<td>to act on, or influence, one another</td>
</tr>
<tr>
<td><strong>intermediate</strong>:</td>
<td>in the middle or being between</td>
</tr>
<tr>
<td><strong>internal</strong>:</td>
<td>of or on the inside</td>
</tr>
<tr>
<td><strong>item</strong>:</td>
<td>object or thing</td>
</tr>
<tr>
<td><strong>label</strong>:</td>
<td>printed material that is fastened to something to provide information about it</td>
</tr>
<tr>
<td><strong>method</strong>:</td>
<td>way of doing something; a process</td>
</tr>
<tr>
<td><strong>minimum</strong>:</td>
<td>the lowest value</td>
</tr>
<tr>
<td><strong>modify</strong>:</td>
<td>to undergo change</td>
</tr>
<tr>
<td><strong>obtain</strong>:</td>
<td>to get possession of, especially by some effort</td>
</tr>
<tr>
<td><strong>obvious</strong>:</td>
<td>easy to see or understand; clear</td>
</tr>
<tr>
<td><strong>occupy</strong>:</td>
<td>to take up time or space</td>
</tr>
<tr>
<td><strong>occur</strong>:</td>
<td>to happen or take place</td>
</tr>
<tr>
<td><strong>participate</strong>:</td>
<td>to take part</td>
</tr>
<tr>
<td><strong>passive</strong>:</td>
<td>induced by an outside agency</td>
</tr>
<tr>
<td><strong>percent</strong>:</td>
<td>in, to, or for every hundred</td>
</tr>
<tr>
<td><strong>physical</strong>:</td>
<td>having to do with the body</td>
</tr>
<tr>
<td><strong>predict</strong>:</td>
<td>to tell what one thinks will happen in the future</td>
</tr>
<tr>
<td><strong>principle</strong>:</td>
<td>basic generalization that is accepted as true and that can be used as a basis for reasoning</td>
</tr>
<tr>
<td><strong>process</strong>:</td>
<td>series of steps performed in doing something</td>
</tr>
<tr>
<td><strong>project</strong>:</td>
<td>(noun) a plan or activity to be done; (verb) to set forth or calculate, to cause to fall upon a surface, to throw, to present an idea</td>
</tr>
<tr>
<td><strong>proportion</strong>:</td>
<td>the relation of one part to another or to the whole</td>
</tr>
<tr>
<td><strong>regulate</strong>:</td>
<td>to control according to rules or a system</td>
</tr>
<tr>
<td><strong>respond</strong>:</td>
<td>to react</td>
</tr>
<tr>
<td><strong>reverse</strong>:</td>
<td>to go in the opposite direction</td>
</tr>
<tr>
<td><strong>rigid</strong>:</td>
<td>not bending or moving; stiff and hard</td>
</tr>
<tr>
<td><strong>role</strong>:</td>
<td>part played by a person or thing</td>
</tr>
<tr>
<td><strong>similar</strong>:</td>
<td>almost, but not exactly the same</td>
</tr>
<tr>
<td><strong>soil</strong>:</td>
<td>mixture of weathered rock, organic matter, water, and air that supports the growth of plant life</td>
</tr>
<tr>
<td><strong>source</strong>:</td>
<td>that from which something comes into existence, develops, or derives</td>
</tr>
<tr>
<td><strong>sphere</strong>:</td>
<td>three-dimensional object whose surface is the same distance from its center at all points</td>
</tr>
<tr>
<td><strong>substitute</strong>:</td>
<td>thing that takes the place of another; use in place of another</td>
</tr>
<tr>
<td><strong>trace</strong>:</td>
<td>very small amount</td>
</tr>
<tr>
<td><strong>transfer</strong>:</td>
<td>to move or pass from one person, place, or thing to another</td>
</tr>
<tr>
<td><strong>transform</strong>:</td>
<td>to change the nature or condition of</td>
</tr>
<tr>
<td><strong>undergo</strong>:</td>
<td>to go through</td>
</tr>
<tr>
<td><strong>vary</strong>:</td>
<td>to change; to make different</td>
</tr>
<tr>
<td><strong>voluntary</strong>:</td>
<td>acting, done, or given of one's own free will; by choice</td>
</tr>
</tbody>
</table>