About the Consultant

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Life Science
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.
### Exploring and Classifying Life

**Before You Read**

- All science takes place in laboratories.
- All of the changes that take place during an organism’s life are called responses.
- Organisms are classified into groups based on their similarities.

**Exploring and Classifying Life**

<table>
<thead>
<tr>
<th>Before You Read</th>
<th>Exploring and Classifying Life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• All science takes place in laboratories.</td>
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<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Organisms are classified into groups based on their similarities.</td>
</tr>
</tbody>
</table>

**Science Journal**

List three characteristics that you would use to classify underwater life.

Students’ responses will vary. Characteristics might include method of movement, nutrition, and traits like size and color.

**Anticipation Guide/KWL Charts**

Think about what you already know before beginning a lesson and identify what you would like to learn from reading.

**Language-Based Activities**

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

**Academic Vocabulary**

- **Animal**: a plant that completes its life cycle in one year.
- **Apparent**: readily seen, visible, readily understood or perceived; evident; obvious.
- **Area**: amount or extent of a surface.
- **Attach**: to fix or fasten something to something else.
- **Benefit**: to help.
- **Capable**: able to do things; fit.
- **Chemical**: made by chemistry.
- **Chemical bond**: the force holding atoms together in a molecule.
- **Code**: (noun) a set of symbols representing ideas, like the letters of the alphabet.
- **Complex**: composed of two or more parts; complicated.
- **Compound**: (adjective) made of two or more separate parts or elements.
- **Constant**: changing; staying the same.
- **Convert**: to change from one form or function to another.
- **Coordinate**: to cause to work well together.
- **Decline**: to weaken or lessen.
- **Definite**: having exact limits in size, shape, or number of parts.
- **Detect**: to catch or discover; to manage to perceive.
- **Distribute**: to divide among several or many.
- **Dominate**: to control or rule.
- **Energy**: capacity to perform some type of work or activity.
- **Environment**: living and nonliving factors that surround an organism.
- **Estimate**: an opinion of value, quality, size, or cost of something.
- **External**: on, or for use on, the outside of the body.
- **Facilitate**: to make easy or easier.
- **Flexible**: able to bend or flex.
- **Function**: (noun) a specific job or purpose; (verb) to carry out a specific action.
- **Fundamental**: serving as an original or generating source; primary.
- **Generate**: to originate or bring into existence.
- **Hypothesis**: something that is suggested as being true for the purposes of argument or of further investigation.
- **Identical**: same.
- **Individual**: separate.
- **Insert**: to put or fit (something) into something else.

**Vocabulary Development**

Vocabulary words help you to better understand your science lessons. Learning the Academic Glossary can help you score higher on standardized tests.
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.

Review Checklist

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

Graphic Organizers

A variety of visual organizers help you to analyze and summarize information and remember content.
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>Exploring and Classifying Life</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• All science takes place in laboratories.</td>
</tr>
<tr>
<td></td>
<td>• All of the changes that take place during an organism’s life are called responses.</td>
</tr>
<tr>
<td></td>
<td>• Spontaneous generation is the idea that living things come from nonliving things.</td>
</tr>
<tr>
<td></td>
<td>• Organisms are classified into groups based on their similarities.</td>
</tr>
</tbody>
</table>

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

List three characteristics that you would use to classify underwater life.

---

Science Journal
Exploring and Classifying Life
Section 1 What is science?

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 how to solve problems.

Write three facts you discovered about scientific methods as you scanned the section.
1. 
2. 
3. 

Write a paragraph describing scientific methods. Use all of the vocabulary words in your description. Underline each vocabulary word.

experiment

scientific methods
hypothesis
control
variable
theory
law

reject
Main Idea

The Work of Science

I found this information on page __________.

Solving Problems

I found this information on page __________.

Define science using information from this section.

Sequence the steps scientists use to solve problems. Study the figure in your book, then close your book and try to fill in the figure. Check your work by looking back at your book.

State the problem

revise hypothesis

repeat many times

Define the role of controls and variables in an experiment. Fill in the missing words.

A control is the ______________ to which the ______________ of a test is ______________. A variable is ______________ that can be ______________. The number of variables that should be changed during an experiment is ______________.
Section 1 What is science? (continued)

Main Idea

Developing Theories

I found this information on page _________.

Contrast an opinion, a scientific theory, and a scientific law.

Complete the table.

<table>
<thead>
<tr>
<th></th>
<th>Opinion</th>
<th>Scientific Theory</th>
<th>Scientific Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>What it is</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What it is based on</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Measuring with Scientific Units

I found this information on page _________.

Summarize the metric units for each quantity below by listing them.

Length: ____________________________

Volume: ____________________________

Mass: _____________________________

Safety First

I found this information on page _________.

Identify two important safety practices to follow in a laboratory.

1. ____________________________

2. ____________________________

SYNTHESIZE IT

A scientist collects data about ducks’ migration patterns every year between November and April. After five years, she draws conclusions and publishes a scientific paper. Describe the scientific methods she might have used. State why it was important to wait five years before publishing her results.

________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________
Exploring and Classifying Life
Section 2 Living Things

**Predict** what you will learn in Section 2. Read the title and main headings. List three topics that you predict will be discussed in the section.

1. 
2. 
3. 

**Review Vocabulary**

*raw materials*

*Use raw materials in a sentence to show its scientific meaning.*

**New Vocabulary**

*organism*

*Find a sentence in Section 2 that uses each vocabulary term.*

*cell*

*homeostasis*

**Academic Vocabulary**

*chemical*

*Use a dictionary to define chemical.*
Main Idea

What are living things like?

Organize the characteristics that define living things. Complete the graphic organizer.

I found this information on page _________.

Describe the relationship between a stimulus and a response. Complete the table. Then complete the flowchart to describe homeostasis.

<table>
<thead>
<tr>
<th>What It Is</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stimulus</td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td></td>
</tr>
</tbody>
</table>

Homeostasis

Stimulus

The conditions in an organism’s cells change.

Response
Contrast the ways organisms obtain energy in the table.

<table>
<thead>
<tr>
<th>Organism</th>
<th>How It Obtains Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants</td>
<td></td>
</tr>
<tr>
<td>Animals</td>
<td></td>
</tr>
<tr>
<td>Bacteria in places sunlight cannot reach</td>
<td></td>
</tr>
</tbody>
</table>

Classify the needs of all living things. Complete the concept map.

What do living things need?

Choose one living thing and one nonliving thing with which you are familiar. Use the five characteristics of living things to explain how you know that each is living or nonliving. Complete the chart to organize your information.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
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</tr>
</tbody>
</table>
Exploring and Classifying Life
Section 3 Where does life come from?

**Skim** Section 3, and write three questions that you have.
1. 
2. 
3. 

**Define** contaminate and use it in an original sentence.

**Write the vocabulary term that matches each definition.**

- the idea that living things come from nonliving things
- the idea that living things come only from other living things

**Use a dictionary to define estimate as both a noun and a verb.**

- noun: 
- verb: 
Section 3 Where does life come from? (continued)

Main Idea

Life Comes from Life

I found this information on page _________.

Life’s Origins

I found this information on page _________.

Contrast the theories of spontaneous generation and biogenesis. Complete the table.

<table>
<thead>
<tr>
<th>Source of life</th>
<th>Spontaneous Generation</th>
<th>Biogenesis</th>
</tr>
</thead>
</table>

Sequence experiments that were conducted about the theory of spontaneous generation. Complete the time line.

1800s

Who: ______________________________
What: ______________________________

1700s

Who: ______________________________
What: ______________________________

1668

Who: ______________________________
What: ______________________________

Complete key events in the evolution of life on Earth. Identify the event that scientists hypothesize occurred at each time.

about 5 billion years ago: ______________________________

about 4.6 billion years ago: ______________________________

more than 3.5 billion years ago: ______________________________
Section 3 Where does life come from? (continued)

Main Idea

Life’s Origins
I found this information on page __________.

Organize information about Oparin’s hypothesis. Complete the outline.

I. Oparin’s hypothesis of Earth’s early atmosphere composition
   A. ______________
   B. ______________
   C. ______________
   D. ______________

II. What happened in the atmosphere
   A. __________________________
   B. __________________________

Complete the graphic organizer summarizing Stanley Miller and Harold Urey’s experiment.

CONNECT IT

Scientists’ theories of the origin of life have changed over time. How do these changes show the use of scientific methods?

_____________________________________________________

_____________________________________________________

_____________________________________________________

_____________________________________________________
Exploring and Classifying Life

Section 4 How are living things classified?

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

1. _______________________________________________________________________
2. _______________________________________________________________________
3. _______________________________________________________________________
4. _______________________________________________________________________

Describe how an organism’s common name is different from its scientific name.

common name

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

New Vocabulary

Read the definitions below. Write the vocabulary term that matches each definition.

________________________
first and largest category used to classify organisms

________________________
evolutionary history of an organism

________________________
group of similar species

________________________
two-word scientific naming system

Define similar using a dictionary.

similar

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
Section 4 How are living things classified? (continued)

**Main Idea**

**Classification**
I found this information on page __________.

**Details**

**Contrast** historic classification systems. **Identify the categories or criteria used in each system.**

<table>
<thead>
<tr>
<th>Categories or criteria</th>
<th>Early classification</th>
<th>Aristotle</th>
<th>Linnaeus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Summarize** the 6 types of information that modern scientists use to determine an organism’s phylogeny.

1. __________
2. __________
3. __________
4. __________
5. __________
6. __________

**Label** the groups used to classify organisms from least specific to most specific. **Use the word bank to complete the diagram.**

class  genus  order  species
family  kingdom  phylum

---

12 Exploring and Classifying Life
Summarize binomial nomenclature. Complete the sentences.

The first word of an organism’s scientific name is its ___________.

The second word might _____________________________.

Identify four reasons the system of binomial nomenclature is useful.

1. ____________________________

2. ____________________________

3. ____________________________

4. ____________________________

Distinguish between a field guide and a dichotomous key. Complete the Venn diagram.

Field Guide

Dichotomous Key

Both

SYNTHESIZE IT

Choose five similar plants or animals. Use what you know about their structures and features to develop your own dichotomous key to classify your choices. Use a dictionary to find the scientific name of each plant or animal to include in your key.
Exploring and Classifying Life
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>Exploring and Classifying Life</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All science takes place in laboratories.</td>
<td></td>
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</tr>
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<td></td>
</tr>
<tr>
<td>• Organisms are classified into groups based on their similarities.</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
List three important ideas you learned in Chapter 1.
Cells

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>
<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>

**FOLDABLES Study Organizer**

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

**Science Journal**

Write three questions that you would ask a scientist researching cancer cells.

---

---

---

---

---

---

---

---

---

---

---

---

---
# Cells

Section 1 Cell Structure

**Skim** Section 1. Write two questions that come to mind.

1. 

2. 

**Review Vocabulary**

Write sentences using the Review Vocabulary and New Vocabulary words. Use two or more of the vocabulary words in each sentence.

- photosynthesis

**New Vocabulary**

- cell membrane
- cytoplasm
- cell wall
- organelle
- nucleus
- chloroplast
- mitochondrion
- ribosome
- endoplasmic reticulum
- Golgi body
- tissue
- organ

**Academic Vocabulary**

Write sentences using function as a noun and as a verb.

<table>
<thead>
<tr>
<th>function</th>
<th>Noun:</th>
<th>Verb:</th>
</tr>
</thead>
</table>

Main Idea

Common Cell Traits

I found this information on page _________.

I found this information on page _________.

Cell Organization

I found this information on page _________.

Details

Define cell by completing the following statement.

A cell is _________________________________.

Model a prokaryotic cell and a eukaryotic cell. Show the difference between the two types.

<table>
<thead>
<tr>
<th>Prokaryotic Cell</th>
<th>Eukaryotic Cell</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Organize information about eukaryotic cell parts in the table.

<table>
<thead>
<tr>
<th>Part</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell wall</td>
<td></td>
</tr>
<tr>
<td>Nucleus</td>
<td></td>
</tr>
<tr>
<td>Chloroplast</td>
<td></td>
</tr>
<tr>
<td>Mitochondria</td>
<td></td>
</tr>
<tr>
<td>Ribosomes</td>
<td></td>
</tr>
<tr>
<td>Endoplasmic reticulum</td>
<td></td>
</tr>
<tr>
<td>Golgi bodies</td>
<td></td>
</tr>
<tr>
<td>Lysosomes</td>
<td></td>
</tr>
</tbody>
</table>
Sequence the following terms from simplest (at the top) to most complex in the chart below. Define each term and provide an example.

<table>
<thead>
<tr>
<th>tissue</th>
<th>organism</th>
<th>cell</th>
<th>organ system</th>
<th>organ</th>
</tr>
</thead>
</table>

Term: ______________  Example: ______________
Definition: __________________________________________

Term: ______________  Example: ______________
Definition: __________________________________________

Term: ______________  Example: ______________
Definition: __________________________________________

Term: ______________  Example: ______________
Definition: __________________________________________

Term: ______________  Example: ______________
Definition: __________________________________________

SYNTHESIZE IT

Compare and contrast animal and plant cells.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Cells
Section 2 Viewing Cells

Predict three things that might be discussed in this section after reading its headings.

1. 
2. 
3. 

Use magnify in a sentence.

magnify

Find a sentence in Section 2 in which cell theory is used and write it here.

cell theory

Define compound as an adjective. Use a dictionary if you need to.

compound

Locate and write a sentence in Section 2 in which the word compound is used as an adjective.
### Main Idea

**Magnifying Cells**

I found this information on page _________.

---

**Details**

**Summarize** information in your book to describe van Leeuwenhoek’s microscope.

---

**Evaluate** the total magnification of a microscope with a 10X eyepiece lens and a 43X objective lens. Write the equation for finding total magnification. Then use it to show your calculation.

\[
\text{total magnification} = \text{magnification of eyepiece} \times \text{magnification of objective lens}
\]

\[
\text{total magnification} = \frac{10 \times 43}{100} = 4.3
\]

---

**Compare** compound microscopes with electron microscopes by completing the Venn diagram with at least seven facts.

<table>
<thead>
<tr>
<th>Compound Microscopes</th>
<th>Both</th>
<th>Electron Microscopes</th>
</tr>
</thead>
</table>

---

I found this information on page _________.

---

Cells
Section 2 Viewing Cells (continued)

Main Idea

Cell Theory

I found this information on page ___________.

Details

Summarize discoveries made by scientists that led to the cell theory.

Robert Hooke

Matthias Schleiden

Theodor Schwann

Rudolf Virchow

List the 3 main principles of the cell theory.

1. ___________
2. ___________
3. ___________

CONNECT IT

Describe how the development of the cell theory shows that scientific beliefs can change over time. Use specific examples.

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________
Scan Section 3 of this chapter. Write three questions based on headings in the section. Answer the questions as you read.

1. 
2. 
3. 

Define disease using your book or a dictionary.

Disease

Use your book to define each new vocabulary term.

Virus

Host cell

Use a dictionary to define apparent.

Apparent

Explain what the following sentence means.

The virus is still in your body’s cells, but it is hiding and doing no apparent harm.
Main Idea

What are viruses?
I found this information on page _________.

How do viruses multiply?
I found this information on page _________.

Details

Organize information about viruses by completing the outline.

Viruses
I. Definition: ________________________________

II. Description:
A. Size: ________________________________

B. Shapes: ________________________________

III. Diseases caused by viruses
A. ____________________ C. ____________________
B. ____________________ D. ____________________

Summarize what a virus needs to reproduce.

Distinguish between an active virus and a latent virus.

A(n) ____________________ enters a host cell, immediately causes the cell to make new viruses, and destroys the cell.

A(n) ____________________ enters a host cell, but does not immediately make new viruses or destroy the cell.

Sequence the events when an active virus enters a host cell.
### Section 3 Viruses (continued)

#### Main Idea

**How do viruses affect organisms?**

_I found this information on page _________._

#### Details

**Define** bacteriophage and _explain what it does to a bacterium._

---

**Fighting Viruses**

_I found this information on page _________._

**Sequence** _the steps by which interferons work._

1. 
2. 
3. 
4. 

---

**Research with Viruses**

_I found this information on page _________._

**Summarize** _how scientists use viruses in gene therapy._

---

**CONNECT IT**

Describe why it is not a good idea to take antibiotics for a cold.

---

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Tie It Together

A scientist is researching an unknown disease. After examining the disease-causing agent with a compound microscope and testing it in various ways, she has decided that the disease should be treated with an antibiotic drug to disrupt its membrane and prevent it from reproducing. Describe what is causing the disease and how you know.
Cells  Chapter Wrap-Up

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

<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

What are the three most important ideas in the chapter?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Cell Processes

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.

Science Journal

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. __________________________________________

**Review Vocabulary**

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

<table>
<thead>
<tr>
<th>term</th>
<th>sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>cell</td>
<td></td>
</tr>
<tr>
<td>mixture</td>
<td></td>
</tr>
</tbody>
</table>

**New Vocabulary**

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

<table>
<thead>
<tr>
<th>term</th>
<th>sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>mixture</td>
<td></td>
</tr>
<tr>
<td>organic compound</td>
<td></td>
</tr>
<tr>
<td>enzyme</td>
<td></td>
</tr>
<tr>
<td>inorganic compound</td>
<td></td>
</tr>
</tbody>
</table>

**Academic Vocabulary**

Use a dictionary to define chemical bond.

<table>
<thead>
<tr>
<th>term</th>
<th>definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>chemical bond</td>
<td></td>
</tr>
</tbody>
</table>
The Nature of Matter

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

Mixtures

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

A mixture is ____________________________

______________________________

Both solutions and suspensions ____________________________

______________________________

In a solution, ____________________________

______________________________

In a suspension, ____________________________

______________________________
Main Idea

Organic Compounds
I found this information on page ________.

Inorganic Compounds
I found this information on page ________.

Details

Summarize the functions of the 4 main organic compounds.

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

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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. 

Define cytoplasm to show its scientific meaning.

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

Use a dictionary to define the term facilitate.

facilitate
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. 
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>
Cell Processes
Section 3 Energy for Life

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

Read the definitions below. Write the vocabulary term that matches the definition in the blank to the left.

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.
### Main Idea

**Trapping and Using Energy**

*I found this information on page __________.*

### Details

**Model** a chemical reaction in which an enzyme changes two smaller molecules into one larger molecule.

### 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></td>
</tr>
<tr>
<td></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 __________. 
Summarize the process of respiration. State what is broken down and what the products are.

Compare fermentation with respiration.

### Comparing Fermentation and 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$_2$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>in muscle cells:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>________________</td>
<td></td>
</tr>
<tr>
<td></td>
<td>in yeast cells:</td>
<td></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

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.
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>
</thead>
<tbody>
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☐ Look over the Chapter Review at the end of the chapter.

SUMMARIZE IT
List three important ideas in the chapter.

________________________________________
________________________________________
________________________________________
________________________________________
________________________________________
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.

- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
-
Cell Reproduction
Section 1 Cell Division and Mitosis

**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. 

**Review Vocabulary**

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

- nucleus

**New Vocabulary**

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

**Academic Vocabulary**

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
Section 1  Cell Division and Mitosis (continued)

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 3 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. ____________________________________________
   ____________________________________________
Section 1 Cell Division and Mitosis (continued)

Main Idea

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

Asexual Reproduction

I found this information on page ____________.

I found this information on page ____________.

I found this information on page ____________.

Name ___________________________ Date __________________

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?

CONNECT IT
Cell Reproduction
Section 2 Sexual Reproduction and Meiosis

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

Use a dictionary to define process.

process
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>Diploid</td>
</tr>
<tr>
<td>Number of chromosomes</td>
</tr>
<tr>
<td>Process that produces them</td>
</tr>
<tr>
<td>Examples</td>
</tr>
</tbody>
</table>

Model the 4 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>
Model what takes place inside a cell nucleus during meiosis II by drawing the 4 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></th>
<th>Meiosis I</th>
<th>Meiosis II</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many cells result?</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Is a haploid cell formed?</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Do chromatids separate?</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>heredity</th>
</tr>
</thead>
<tbody>
<tr>
<td>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</td>
</tr>
<tr>
<td>section of DNA that contains instructions for making specific proteins</td>
</tr>
<tr>
<td>ribonucleic acid; type of nucleic acid that contains the sugar ribose, phosphates, and bases adenine, guanine, cytosine, and uracil</td>
</tr>
<tr>
<td>any permanent change in a gene or chromosome of a cell; may be beneficial, harmful, or have little effect on an organism</td>
</tr>
</tbody>
</table>

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.

| code |
| 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. ________________ 3. ________________
2. ________________ 4. ________________

Model a section of a DNA molecule, showing its twisted-ladder structure. Label the 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.
Tie It Together

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.
Cell 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>Cell Reproduction</th>
<th>After You Read</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>

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SUMMARIZE IT
List three important ideas from this chapter.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

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

Foldables

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

Science Journal

Write three traits that you have and how you would determine how those traits were passed to you.
Skim Section 1 of the chapter. Write two questions that come to mind from reading the headings of this section.

1. 

2. 

Define meiosis.

meiosis

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

Use a dictionary to define physical.

physical
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>Black dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blond dog</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>b</td>
</tr>
<tr>
<td></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 3 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.

____________________________________________________________________
____________________________________________________________________

54  Heredity
### Heredity
Section 2 Genetics Since Mendel

<table>
<thead>
<tr>
<th><strong>Scan</strong> the headings and illustrations in Section 2. Write two facts you learned about genetics as you scanned the section.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
</tr>
</tbody>
</table>

### Review Vocabulary

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

- **gene**

### New Vocabulary

**Define each vocabulary term.**

- **incomplete dominance**
- **polygenic inheritance**
- **sex-linked gene**

### Academic Vocabulary

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

I found this information on page _________.

Polygenic Inheritance

I found this information on page _________.

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

Gene for bright plumage is present.

- Female bird activate gene. Chemicals ________ expressed.
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: ____________

Father’s genotype: ____________

Child’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.

SYNTHESIZE IT
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.

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**

I found this information on page ________.

I found this information on page ________.

I found this information on page ________.

**Details**

**Distinguish** three uses for genetic engineering.

1. ___________________________

2. ___________________________

3. ___________________________

**Organize** information about recombinant DNA. Complete the graphic organizer.

![Graphic Organizer](Recombinant DNA diagram)

**Produced by:**

**Used for:**

**Summarize** how gene therapy may be used in the future.

_____________________________________

_____________________________________

_____________________________________

_____________________________________

_____________________________________
Main Idea

Genetic Engineering

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

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>
</tbody>
</table>

Details

I found this information on page ___________.

I found this information on page ___________.

CONNECT IT

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

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

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

<table>
<thead>
<tr>
<th>gene</th>
<th>group of organisms that share similar characteristics and can reproduce among themselves, producing fertile offspring</th>
</tr>
</thead>
</table>

Write the correct term next to its definition.

hypothesis

Use your book or a dictionary to define hypothesis.

<table>
<thead>
<tr>
<th>hypothesis</th>
<th>process by which organisms with traits best suited to their environment are more likely to survive and reproduce</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>gene</th>
<th>any variation that makes an organism better suited to its environment</th>
</tr>
</thead>
</table>

Name __________________________ Date ________________
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.

Analyse 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></th>
<th>Variation</th>
<th>Adaptation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section 1 Ideas About Evolution (continued)

Complete the table explaining factors that can lead to changes in a population.

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

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

Gradualism

Punctuated Equilibrium

Both

SYNTHESIZE IT

Describe how natural selection can lead to the formation of a new species. Include factors such as migration and geographic isolation.

---

Adaptations over Time
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

Adaptations over Time 67
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.

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

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

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 __________________________
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. 

**Review Vocabulary**
Define opposable using your book.

opposable

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

primates

hominid

Homo sapiens

**Academic Vocabulary**
Use a dictionary to define similar.
similar

Name __________________________ Date ______________
Section 3 The Evolution of Primates (continued)

Main Idea

Primates

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: _______________________

Adaptations over Time
Organize information about the origins of modern humans. Complete the diagram.

**Early Homo sapiens**
(about 400,000 years ago)

__________ about __________ years ago

__________ years ago

(Homo sapiens sapiens)

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

Neanderthals

Cro-Magnon humans

CONNECT IT

Hypothesize how scientists might determine whether Neanderthals are ancestors of modern humans.
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>
<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>

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 adaptations of organisms over time.
Bacteria

Before You Read

Preview the chapter and section titles and the section headings. Complete the first two columns of the table 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 ways that bacteria can be harmful and ways that bacteria can be beneficial. Which list is longer?

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
Bacteria
Section 1 What are bacteria?

Scan Section 1 of the chapter.
- Read all headings and bold words.
- Look at all of the illustrations.
- Think about what you already know about bacteria.

Write three facts that you learned while scanning the section.
1. ____________________________
2. ____________________________
3. ____________________________

Define prokaryotic to show its scientific meaning.

Read the definitions below. Write the key term on the blank in the left column.

organism that uses oxygen for respiration

simplest form of asexual reproduction, in which two new cells are produced that have genetic material that is identical to each other and to the original cell

whiplike tails that help many bacteria move

organism that is adapted to live without oxygen

Use a dictionary to define the term environment.
Section 1 What are bacteria? (continued)

Main Idea

Characteristics of Bacteria
I found this information on page __________.

Details

Identify 3 shapes of bacterial cells.
1. cocci: ____________________________
2. bacilli: ____________________________
3. spirilla: ____________________________

Summarize how the following pairs of words relate to bacteria.
Asexual Reproduction/Sexual Reproduction: ________________

Producers/Consumers: ____________________________

Aerobes/Anaerobes: ____________________________
Complete the graphic organizer about the characteristics of cyanobacteria.

Cyanobacteria

- produce __________ as waste
- contain chlorophyll and __________
- use carbon dioxide, sunlight, and water to __________
- are food for __________

Summarize the different types of consumer eubacteria.

Archaebacteria

Identify three types of extreme environments in which archaebacteria can survive.

Summarize how methane-producing bacteria obtain energy.
Skim the headings in Section 2. What do you think are two major ideas that will be discussed in this section?

1. 

2. 

Define disease and use it in an original sentence.

disease

Match the definitions with the appropriate key terms.

- chemical produced by some bacteria that is used to limit the growth of other bacteria
- organism that uses dead organisms for food and energy
- bacteria that change nitrogen from the air into forms that plants and animals can use
- organism that causes disease
- poisonous substance produced by some pathogens
- thick-walled, protective structure produced by some bacteria when conditions are unfavorable for survival
- preparation made from killed bacteria or damaged particles from bacterial cell walls that can prevent some bacterial diseases

Use a dictionary to define the term benefit.

benefit
Analyze how some bacteria help you. Complete the paragraph.

__________ are helpful in many ways. Without them, you would not be able to stay ____________ for very long. Bacteria in the ____________ produce ____________ which is needed for blood clotting. Some bacteria produce ____________. These chemicals ________________ of other bacteria.

Summarize the roles of saprophytes and nitrogen-fixing bacteria in the environment.

Role of saprophytes: 

______________________________

______________________________

______________________________

Nitrogen-fixing bacteria: 

______________________________

______________________________

______________________________

Complete the table describing some of the ways people use bacteria.

<table>
<thead>
<tr>
<th>Human Uses for Bacteria</th>
<th>How do the bacteria help?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioremediation</td>
<td></td>
</tr>
<tr>
<td>Food Production</td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td></td>
</tr>
</tbody>
</table>
Analyze how pathogens make you sick. Complete the paragraph.

Pathogens can enter your body when you _______________ and through _______________. Once inside the body, they can multiply, _______________, and cause _______________.

Complete the graphic organizer about pasteurization.

Most harmful bacteria are killed because

________________________________________

________________________________________.

The _______________ does not change.

The process is used to prepare these foods: ______________________

________________________________________

Summarize information about vaccines.

________________________________________

________________________________________

________________________________________

________________________________________

Summarize it

Explain why it is important to learn about bacteria.

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________
Review the ideas that you listed in the table at the beginning of the chapter. Cross out any incorrect information in the first column. Then complete the table by filling in the third column. How do your ideas about what you know now compare with those you provided at the beginning of the chapter?

<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.
- 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 three important ideas in this chapter.
Protists and Fungi

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>Protists and Fungi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Some protists have roots like those of plants.</td>
</tr>
<tr>
<td></td>
<td>• The oxygen you breathe comes partly from green algae.</td>
</tr>
<tr>
<td></td>
<td>• Protozoans are usually classified by what they eat.</td>
</tr>
<tr>
<td></td>
<td>• Lichens can indicate the pollution level in an area.</td>
</tr>
</tbody>
</table>

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

In what ways might fungi benefit other organisms and the environment?

__________________________

__________________________

__________________________

__________________________

__________________________

__________________________
 Protists and Fungi
Section 1 Protists

**Preview** the What You’ll Learn statements for Section 1. Rewrite each statement as a question. Look for the answers as you read the section.

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

**Define** asexual reproduction to show its scientific meaning.

**New Vocabulary**

Use a dictionary to define visible.

**Academic Vocabulary**

- one-celled or many-celled eukaryotic organism that lives in moist or wet surroundings
- plantlike protists
- one-celled, animal-like protist
- long, thin, whiplike structure used for movement
- short, threadlike structures that extend from the cell membrane and help the organism move quickly
- temporary extension of cytoplasm that helps some protists move
Main Idea

What is a protist?

I found this information on page __________.

Plantlike Protists

I found this information on page __________.

Importance of Algae

I found this information on page __________.

Details

Compare and contrast the 3 groups of protists.

<table>
<thead>
<tr>
<th></th>
<th>Plantlike</th>
<th>Animal-like</th>
<th>Funguslike</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do they make their own food?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there a cell wall?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can they move?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarize key information about plantlike protists.

Diatoms: __________________________________________________________________________

Dinoflagellates: ____________________________________________________________________

Euglenoids: _________________________________________________________________________

Red algae: _________________________________________________________________________

Green algae: _______________________________________________________________________

Brown algae: _______________________________________________________________________

Evaluate the importance of algae.

<table>
<thead>
<tr>
<th>Algae in the Environment</th>
<th>Human Uses of Algae</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Classify protozoans. Summarize key information about each type of protozoan.

<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics</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 the importance of protozoans to other organisms.

Complete the prompts with information about funguslike protists.

Funguslike protists produce like fungi and must take in food from . Slime molds use to move and live on or in moist, cool, shady environments. Downy molds and mildews grow as a mass of over an organism. Some are parasites; others feed on . Funguslike protists in the ecosystem help break down . Some are to other organisms.

Why is it dangerous to drink water from unknown sources?

CONNECT IT

Name ____________________________ Date ________________

Section 1 Protists (continued)

Main Idea

Animal-Like Protists

I found this information on page _______.

Importance of Protozoans

I found this information on page _______.

Funguslike Protists

Funguslike Protists and Importance of Funguslike Protists

I found this information on page _______.

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86 Protists and Fungi
Protists and Fungi  
Section 2 Fungi

Skim Section 2. Predict two topics that will be covered.
1. ________________________________
2. ________________________________

Define photosynthesis using your book or a dictionary.

Write the correct vocabulary word next to its definition.

mass of threadlike tubes forming the body of a fungus
organism that absorbs energy from dead and decaying tissues
waterproof reproductive cell that can grow into a new organism
reproductive cells produced by club fungi
reproductive cells produced by sac fungi
form of asexual reproduction in which a new, genetically identical organism forms on the side of its parent
case containing reproductive cells produced by some types of fungi
organism made up of a fungus and a green alga or a cyanobacterium
network of hyphae and plant roots that helps plants absorb water and minerals from the soil

Use a dictionary to define decline.
Main Idea

What are fungi?
I found this information on page __________.

Details

Complete the table to describe the characteristics of fungi.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Obtaining Food</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compare club, sac, and zygote fungi.

<table>
<thead>
<tr>
<th>Examples</th>
<th>How they reproduce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Club fungi</td>
<td></td>
</tr>
<tr>
<td>Sac fungi</td>
<td></td>
</tr>
<tr>
<td>Zygote fungi</td>
<td></td>
</tr>
</tbody>
</table>

Summarize why some fungi are difficult to classify.
I found this information on page __________.
Describe what nature would be like without lichens, mycorrhizae, and decomposer fungi.

Identify three important roles of lichens.

1. ____________________________________________
2. ____________________________________________
3. ____________________________________________

Model the beneficial relationship between fungi and plants by completing the diagram.

Some fungi and plants form a network of ____________ and ____________ called ____________.

The fungi help the plants
__________________________
__________________________

The plants supply _________
and _________ to the fungi.

Identify the importance of fungi in each of these areas.

<table>
<thead>
<tr>
<th>Foods</th>
<th>Agriculture</th>
<th>Health and Medicine</th>
<th>Decomposers</th>
</tr>
</thead>
</table>

The Importance of Fungi

I found this information on page ____________.
Protists and Fungi  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>Protists and Fungi</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Some protists have roots like those of plants.</td>
<td></td>
</tr>
<tr>
<td>• The oxygen you breathe comes partly from green algae.</td>
<td></td>
</tr>
<tr>
<td>• Protozoans are usually classified by what they eat.</td>
<td></td>
</tr>
<tr>
<td>• Lichens can indicate the pollution level in an area.</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.
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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

After reading the chapter, write three facts you learned that you did not know before.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
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></td>
<td>• In tropical rain forests, there are more than 260,000 known plant species and probably more to be identified.</td>
</tr>
<tr>
<td></td>
<td>• Land plants’ ancestors may have been green algae that lived in the sea.</td>
</tr>
<tr>
<td></td>
<td>• Ferns and mosses produce spores rather than seeds.</td>
</tr>
<tr>
<td></td>
<td>• Paper and clothing are made from seed plants.</td>
</tr>
</tbody>
</table>

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

Science Journal

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. ____________________________________________

**Review Vocabulary**

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

**species**

____________________________________________

____________________________________________

____________________________________________

**New Vocabulary**

Use your book to define the following key terms.

**cuticle**

____________________________________________

____________________________________________

____________________________________________

**cellulose**

____________________________________________

____________________________________________

____________________________________________

**vascular plant**

____________________________________________

____________________________________________

____________________________________________

**nonvascular plant**

____________________________________________

____________________________________________

____________________________________________

**Academic Vocabulary**

**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 ___________.

Origin and Evolution of Plants
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

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.

<table>
<thead>
<tr>
<th>Plant Adaptations to Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Classify into two major groups called ____________

was developed by ____________

gives each plant species its own ____________

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

_____________________________________________________

_____________________________________________________

_____________________________________________________

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Main Idea

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

I found this information on page ____________.

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.*

![Venn diagram showing the comparison between seedless vascular plants and seedless nonvascular plants.](image)

**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.

___________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________________
Plants
Section 3 Seed Plants

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.

seed ____________________________________________________________________

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.

annual ____________________________________________________________________
Main Idea

Characteristics of Seed Plants

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

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>
Complete the chart below about gymnosperms by writing about the characteristic listed in that cell.

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

Complete the chart below about angiosperms by writing about the characteristic listed in that cell.

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

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

Gymnosperms:
1. 
2. 

Angiosperms:
1. 
2. 
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.
2. Write a D if you disagree with the statement.

<table>
<thead>
<tr>
<th>Plants</th>
<th>After You Read</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>
<td>• Land plants’ ancestors may have been green algae that lived in the sea.</td>
<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>

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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 plants.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Plants After You Read

• In tropical rain forests, there are more than 260,000 known plant species and probably more to be identified.
• Land plants’ ancestors may have been green algae that lived in the sea.
• Ferns and mosses produce spores rather than seeds.
• Paper and clothing are made from seed 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>Plant Reproduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Both humans and plants need water, oxygen, energy, and food to grow.</td>
<td></td>
</tr>
<tr>
<td>• Ferns and mosses reproduce by forming spores.</td>
<td></td>
</tr>
<tr>
<td>• All seeds are produced by flowering plants.</td>
<td></td>
</tr>
<tr>
<td>• Some seeds are spread by gravity.</td>
<td></td>
</tr>
</tbody>
</table>

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

List three plants that reproduce by forming seeds.

---

Name ___________________________ Date ________________________

Plant Reproduction

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Scan Section 1 of your book using the checklist below.

- 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 plant reproduction.

Write three facts that you discovered about plant reproduction as you scanned this section.

1. 
2. 
3. 

Define fertilization in a sentence that shows its scientific meaning.

fertilization

Use your book to define the following terms.

spore

gametophyte stage

sporophyte stage

Use a dictionary to define identical.

identical
Main Idea

Types of Reproduction
I found this information on page ____________.

Compare and contrast two ways that plants reproduce.

Sequence the steps in plant fertilization. Complete the flow chart.

Female reproductive structures produce ____________.
Male reproductive structures produce ____________.

Are both structures found on the same plant?

No

Yes
Main Idea

Plant Life Cycles

Model the two stages of a plant’s life cycle by labeling the diagram below with the following terms.

- gametophyte plant structures \( (n) \)
- sporophyte plant structures \( (2n) \)
- sex cells (sperm and eggs) \( (n) \)
- spores \( (n) \)

Contrast the gametophyte and sporophyte stages of plant development. Complete the table.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Cell type</th>
<th>Reproductive cells formed</th>
<th>How reproductive cells form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gametophyte</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sporophyte</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONNECT IT

A plant breeder wants to develop new varieties of roses that have different traits from the varieties he already has. Describe the type of reproduction the breeder is most likely to use and why.
Skim Section 2 of your book. Read the headings and look at the illustrations. Write three questions that come to mind.

1. 

2. 

3. 

Define photosynthesis using your book or a dictionary.

photosynthesis

Use your book to define the following terms.

frond

rhizome

sori

prothallus

Use a dictionary to define widespread.

widespread
Summarize the role of spores in plant reproduction.

Spores are used by ________________________________ to reproduce. The __________________ stage of the plant produces ________________ spores in __________________. These ________________, and the spores are spread by _________________. The spores grow into ________________ that can produce _________________.

Sequence the life cycle of a moss. Complete the flow chart.

Distinguish two ways in which nonvascular plants reproduce asexually.

<table>
<thead>
<tr>
<th>Type of Plant</th>
<th>Asexual Reproduction Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>moss</td>
<td></td>
</tr>
<tr>
<td>liverwort</td>
<td></td>
</tr>
</tbody>
</table>
Suppose that you are walking through a forest and you see some moss plants and ferns. Describe how you could know the stage of its life cycle each kind of plant is in.
Plant Reproduction
Section 3  Seed Reproduction

Predict three things that will be discussed in Section 3.
1. ________________________________
2. ________________________________
3. ________________________________

Define gymnosperms using your book or a dictionary.

Match each vocabulary term to its definition.

__________ small structure produced by the male reproductive organs of a seed plant
__________ transfer of pollen grains to the female part of a seed plant
__________ series of events that results in the growth of a plant from a seed
__________ part of a plant that produces the egg
__________ male reproductive organ in a flower
__________ female reproductive organ in a flower
__________ part of a flower in which ovules are found

Use a dictionary to define structure as it is used in science.
Summarize key facts about pollen and pollination. Complete the outline.

Pollen and Pollination in Seed Plants
I. Pollen grains
   A. 
   B. 
II. Pollination
   A. 
   B. 

Model a seed. Draw a seed and label the stored food, embryo, and seed coat. Identify the role of each part of the seed.

Sequence steps of gymnosperm seed formation in the flow chart.

Male: produced in 
Female: produced in 

 carried by 
fertilization
The seeds of horse chestnut trees are covered with a prickly outer layer. Propose a way that you think these seeds might be dispersed.

---

Model a flower by drawing and labeling its parts. Then write a brief caption to identify the male and female reproductive organs and to describe how each organ functions during fertilization.

---

Sequence the events of fertilization and germination in angiosperms.

1. Flower is ____________________________
2. ____________________________
3. ____________________________
4. Seed is ____________________________
5. Conditions become right for ____________________________
6. ____________________________
7. ____________________________
8. Root grows from ____________________________
9. ____________________________

---

The seeds of horse chestnut trees are covered with a prickly outer layer. Propose a way that you think these seeds might be dispersed.
Describe a Plant

Suppose that you are an explorer who has discovered a new species of plant.

• Draw and describe the plant below.
• Be sure to indicate whether your plant is vascular or nonvascular.
• If it does reproduce with seeds, identify it as an angiosperm or a gymnosperm.
• Include a diagram that shows the plant’s life cycle.
• Draw a cross-section of the plant that identifies its reproductive structures.
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>Plant Reproduction</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Both humans and plants need water, oxygen, energy, and food to grow.</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.

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

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

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Plant Processes

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>Plant Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Plants make their own food.</td>
<td></td>
</tr>
<tr>
<td>• Plants break down food to release energy.</td>
<td></td>
</tr>
<tr>
<td>• Plant stems grow away from light.</td>
<td></td>
</tr>
<tr>
<td>• Plants have hormones that control changes in their growth.</td>
<td></td>
</tr>
</tbody>
</table>

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

Science Journal

Describe what would happen to life on Earth if all the green plants disappeared.
Plant Processes
Section 1 Photosynthesis and Respiration

Scan the illustrations in Section 1. Write three questions that you have about plants. Try to answer your questions as you read.

1. __________________________________________
2. __________________________________________
3. __________________________________________

Define cellulose using your book. Then write a sentence to illustrate its scientific meaning.

cellulose

Use your book to define the following terms.

stomata

chlorophyll

photosynthesis

respiration

Use a dictionary to define release.

release
Main Idea

**Taking In Raw Materials**

I found this information on page __________.

---

**Details**

**Organize** what you know about the different layers of a plant’s leaves by completing the table below.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidermis</td>
<td></td>
</tr>
<tr>
<td>Palisade layer</td>
<td></td>
</tr>
<tr>
<td>Spongy layer</td>
<td></td>
</tr>
</tbody>
</table>

---

**Summarize** why stomata are important structures in a plant leaf.

---

**The Food-Making Process**

I found this information on page __________.

---

**Complete** the equation for photosynthesis. **Identify:**

- the product that is stored as a food source
- the product that is released mostly as waste
- the product made during light-dependent reactions
- the product made during light-independent reactions

\[
6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light energy} \rightarrow \text{Food source: made during } \quad \text{Waste product: made during }
\]

---
Define aerobic respiration.

Complete the equation for aerobic respiration.

\[ \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow \underline{\text{carbon dioxide}} + \underline{\text{water}} \]

Compare the processes of photosynthesis and aerobic respiration by completing the table.

<table>
<thead>
<tr>
<th></th>
<th>Photosynthesis</th>
<th>Aerobic Respiration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raw materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell structure in which process occurs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Create a concept map or other diagram to summarize what you learned in this section about plant structure and function.
Plant Processes
Section 2 Plant Responses

Scan Section 2. Predict three things that you will learn.
1. 
2. 
3. 

Define behavior using your book.

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

response of a plant to external stimuli, movement caused by change in growth

type of plant hormone that causes plant stems and leaves to exhibit positive responses to light

plant’s response to the number of hours of daylight and darkness it receives

plant that generally requires short nights—less than 12 hours of darkness—to begin the flowering process

plant that generally requires long nights—12 or more hours of darkness—to begin the flowering process

plant that does not require a specific photoperiod and can begin the flowering process over a range of night lengths

Academic Vocabulary
Use a dictionary to define involve.

involve
**Main Idea**

**What are plant responses?**

I found this information on page ______.

---

**Details**

**Distinguish** the types of stimuli as internal or external.

1. a stimulus that comes from outside the body
2. a stimulus that comes from inside the body

**Tropisms**

I found this information on page ______.

---

**Plant Hormones**

I found this information on page ________.

---

**Complete** the table below. Identify the stimulus for each described response.

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant stem grows faster on one side. Stem bends and twists around object.</td>
<td></td>
</tr>
<tr>
<td>Plant bends toward light. Leaves turn and absorb more light.</td>
<td></td>
</tr>
<tr>
<td>Roots grow downward. Stems grow upward.</td>
<td></td>
</tr>
</tbody>
</table>

**Compare** the effects of different hormones that affect plants.

- **Ethylene** helps stems grow toward light
- **Gibberellins** causes seeds sprouting and buds from developing in winter, and tomatoes opening on hot days
- **Cytokinin**s stimulate plants
**Main Idea**

**Plant Hormones**
I found this information on page __________.

**Details**

Create a diagram to illustrate how auxin causes a stem to grow in response to sunlight. Write a short caption to describe where auxin is concentrated in the stem.

**Photoperiods**
I found this information on page __________.

Complete the table below to show your understanding of the effects of photoperiodism on different types of plants.

<table>
<thead>
<tr>
<th>Type of Plant</th>
<th>Hours of Darkness Needed to Flower</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>need less than 12 hours</td>
<td>spinach, lettuce, and beets</td>
</tr>
<tr>
<td></td>
<td>need 12 or more hours</td>
<td>poinsettias, strawberries, and ragweed</td>
</tr>
<tr>
<td></td>
<td>do not need a specific amount of light</td>
<td>dandelions and roses</td>
</tr>
</tbody>
</table>

**CONNECT IT**

Explain plant responses you might see in plants that are growing indoors on a windowsill.

______________________________________________________________

______________________________________________________________

______________________________________________________________
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>Plant Processes</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Plants make their own food.</td>
<td></td>
</tr>
<tr>
<td>• Plants break down food to release energy.</td>
<td></td>
</tr>
<tr>
<td>• Plant stems grow away from light.</td>
<td></td>
</tr>
<tr>
<td>• Plants have hormones that control changes in their growth.</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 plant processes.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
Introduction to Animals

Before You Read

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

Science Journal

List the animals you may find living around a coral reef.

_________________________________

_________________________________

_________________________________

_________________________________

_________________________________

_________________________________
Introduction to Animals
Section 1 Is it an animal?

Scan the headings in Section 1 of the chapter. Identify three topics that are discussed.

1. ____________________________
2. ____________________________
3. ____________________________

Define adaptation using your book or a dictionary.

adaptation

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

animal that eats both plants and animals; mammals with specialized teeth for eating plants and animals

arrangement of body parts in a circle around a center point

an animal without a backbone

animal that eats only other animals or the remains of other animals

arrangement of body parts into halves that are nearly mirror images of each other

animal that eats only plants or parts of plants

an animal that has a backbone

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

definite
Main Idea

Animal Characteristics
I found this information on page ____________.

Details

Summarize the characteristics of animals by completing the following main points.

Animals get their food from ____________________________.

Many animals move from place to place to find ________________, ________________, and/or ________________.

All animals can reproduce ________________. Some also can reproduce ________________.

Animal cells have a ________________ and other parts inside called ________________.

How Animals Meet Their Needs

Compare animal adaptations by completing the chart.

<table>
<thead>
<tr>
<th>How Animals Meet Their Needs</th>
<th>Adaptations</th>
<th>Animal Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ways to get energy</td>
<td>eat plants</td>
<td>deer, some fishes</td>
</tr>
<tr>
<td>Physical features</td>
<td>large size</td>
<td>moose, bison</td>
</tr>
<tr>
<td>Behaviors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I found this information on page ____________.
Complete and label the circle graph to compare the percent of known animals that are vertebrates with the percent of known animals that are invertebrates.

**Animal Classification**

Compare forms of animal symmetry by identifying and drawing an example of each below.

- Asymmetrical Symmetry
- Radial Symmetry
- Bilateral Symmetry

**Summarize It**

Analyze the physical or behavioral adaptations of an animal that protect it from predators.
Review Vocabulary

Define flagella using your book or a dictionary.

flagella

New Vocabulary

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

form of a cnidarian that is bell-shaped and free-swimming

capsule with a threadlike structure containing toxins that help a cnidarian capture food

organisms that remain attached to one place during most of their life

armlike structures that have stinging cells used for getting food

animal that produces both sperm and eggs in the same body

cnidarian body type that is vase-shaped and is usually sessile

Academic Vocabulary

Use a dictionary to define source to show its scientific meaning.
Main Idea

**Sponges and Characteristics of Sponges**

I found this information on page _________.

Details

**Summarize information about sponges.**

Sponges appeared on Earth about _________________.

Most live in _______________. Some have __________ symmetry, but most are _______________. Adult sponges are _______________, which means they do not move. Sponges pull ___________ into their bodies, where cells filter out ___________ and ___________.

**Model a sponge’s body. Label the sponge’s central cavity and pores. Show the path followed by water into and out of the sponge.**

Cnidarians

I found this information on page _________.

**Organize information about the two forms of cnidarians by completing the chart.**

<table>
<thead>
<tr>
<th></th>
<th>Medusa</th>
<th>Polyp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Form (shape)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobility</td>
<td></td>
<td>usually sessile</td>
</tr>
<tr>
<td>Examples</td>
<td>jellyfishes for most of their lives</td>
<td></td>
</tr>
</tbody>
</table>
Main Idea

**Cnidarians**

I found this information on page ___________.

**Corals**

I found this information on page ___________.

Details

**Sequence** the steps in reproduction of medusa forms of cnidarians by completing the cycle chart.

- Medusae bud off polyp.
- Polyp forms _____ that become ___________.
- Fertilized egg develops into ___________.
- Free-swimming medusae release ___________.
- Larva develops into ___________.

Summarize key information about coral reefs in the outline.

**I. Coral reefs**

**A. Formation of coral reefs**

1. Made of__________________________
2. Grow as__________________________
3. Can take _______________ of years to form

**B. Importance of coral reefs**

1. Provide habitat for__________________
2. Protect__________________
3. Provide__________________

Synthesize It

Explain how sponges and cnidarians could be mistaken for plants rather than animals.
Introduction to Animals
Section 3 Flatworms and Roundworms

Scan Section 3 of the chapter. Write four questions that come to mind. Look for answers to your questions as you read the section.

1. __________________________
2. __________________________
3. __________________________
4. __________________________

Define cilia using your book or a dictionary.

cilia

Free-living organisms

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

Anus

Require

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

--------------------------------------------------------
Section 3 Flatworms and Roundworms (continued)

Main Idea

What is a worm?
I found this information on page ____________.

Flatworms
I found this information on page ____________.

Analyze worms by identifying four characteristics below.

Compare characteristics of planarians and flukes by completing the chart below.

<table>
<thead>
<tr>
<th>Flatworms</th>
<th>Planarians</th>
<th>Flukes</th>
</tr>
</thead>
<tbody>
<tr>
<td>How they live</td>
<td></td>
<td>as parasites</td>
</tr>
<tr>
<td>What they eat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How they move</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How they reproduce</td>
<td></td>
<td>usually sexually</td>
</tr>
</tbody>
</table>

Model a tapeworm by sketching it. Label its hooks, its suckers, and a mature segment with eggs.
Summarize what some scientists believe about the origin of flatworms by completing the diagram.

probably the first group of animals to have

Compare and contrast roundworms with flatworms by completing the Venn diagram with at least seven facts.

Flatworms

Roundworms

Both

CONNECT IT
Summarize ways that roundworms are both helpful and harmful.
Preventing Disease

You are working on a public health campaign to inform people of the dangers of parasitic flatworms and roundworms. Create a poster with key information about diseases these organisms can cause and how to avoid them. Use words, pictures, and diagrams to get your message across.
Introduction to Animals  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.
- 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 animals.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Mollusks, Worms, Arthropods, Echinoderms

Before You Read

Before you read the chapter, think about what you know about the topic. List three things you already know about mollusks, worms, arthropods, and echinoderms in the first column. Then list three things you would like to learn about them in the second 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>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

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

List three animals from each animal group you will be studying: mollusks, worms, arthropods, and echinoderms.

```
- Animal 1
- Animal 2
- Animal 3
- Animal 4
- Animal 5
- Animal 6
```

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Section 1 Mollusks

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

1. ________________________________
2. ________________________________
3. ________________________________

Define visceral mass using your book or a dictionary.

visceral mass

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

mantle

gill

open circulatory system

radula

closed circulatory system

Use a dictionary to define relax as it might be used in science.

relax
Section 1 Mollusks (continued)

Main Idea

Characteristics of Mollusks

I found this information on page __________.

Details

Identify characteristics of mollusks in the chart below.

<table>
<thead>
<tr>
<th>Characteristics of Mollusks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of symmetry</td>
</tr>
<tr>
<td>Body description</td>
</tr>
<tr>
<td>Where they live</td>
</tr>
</tbody>
</table>

Model the body of a mollusk by sketching a snail and labeling its shell, mantle, gill, mantle cavity, foot, radula, and other body parts.

I found this information on page __________.
Discuss several ways you could protect a boat from being damaged by shipworms.

Compare and contrast types of mollusks by completing the chart.

<table>
<thead>
<tr>
<th>Types of Mollusks</th>
<th>Gastropods</th>
<th>Bivalves</th>
<th>Cephalopods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where do they live?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many shells?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Examples</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Organize the uses of mollusks and the problems they cause by completing the chart below.

- Uses of Mollusks
- Problems Mollusks Cause

I found this information on page _______.
Mollusks, Worms, Arthropods, Echinoderms

Section 2  Segmented Worms

**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** aerate using your book or a dictionary.

*aerate*

**New Vocabulary**

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

**setae**

**crop**

**gizzard**

**Academic Vocabulary**

Use a dictionary to define survive as it might be used in science.

**survive**
Section 2 Segmented Worms (continued)

Main Idea

Segmented Worm Characteristics
Identify characteristics of segmented worms in the chart below.

<table>
<thead>
<tr>
<th>Characteristics of Segmented Worms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of symmetry</td>
</tr>
<tr>
<td>Body description</td>
</tr>
<tr>
<td>Where they live</td>
</tr>
</tbody>
</table>

Earthworm Body Systems
Sequence and define the functions of an earthworm’s digestive system by completing the flow chart.

- **Mouth**: opening through which worm takes in soil
- **Crop**:
- **Gizzard**:
- **Intestine**:
- **Anus**:

Marine Worms
Identify three ways that marine worms move.

Marine worm movement

Name ___________________________ Date ________________

Mollusks, Worms, Arthropods, Echinoderms
Main Idea

**Leeches and Leeches and Medicine**

I found this information on page __________.

**Value of Segmented Worms**

I found this information on page __________.

**Origin of Segmented Worms**

I found this information on page __________.

Details

**Summarize** the process by which leeches feed on the blood of other animals. Then explain how the process is useful in medicine.

**Identify** ways segmented worms are helpful in the organizer below.

**Compare** three similarities of mollusks and worms which suggest that they share a common ancestor.

- 
- 
- 

CONNECT IT

Explain why there are not many fossils of ancient worms.

---

Mollusks, Worms, Arthropods, Echinoderms 141
Scan the What You’ll Learn statements for Section 3 of your book. Identify three topics that will be discussed.

1. ________________________________
2. ________________________________
3. ________________________________

Define venom using your book or a dictionary.

venom

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

appendage

molting

spiracle

metamorphosis

Use a dictionary to define individual as it might be used in science.

individual
Main Idea

Characteristics of Arthropods

I found this information on page __________.

Complete the chart below to identify characteristics of arthropods.

<table>
<thead>
<tr>
<th>Characteristics of Arthropods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of symmetry</td>
</tr>
<tr>
<td>Body description</td>
</tr>
<tr>
<td>Where they live</td>
</tr>
</tbody>
</table>

Details

Organize information about body regions of insects in the outline.

I. Insect body regions

A. Parts of the head

1. ____________________________
2. ____________________________
3. ____________________________

B. Parts of the __________________

1. ____________________________
2. ____________________________
3. spiracles

C. Parts of the __________________

1. ____________________________
2. ____________________________

Arachnids

Identify three arachnids and one unique characteristic of each.

<table>
<thead>
<tr>
<th>Types of Arachnids</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Insects

I found this information on page __________.

Arachnids

I found this information on page __________.
Compare and contrast centipedes and millipedes by completing the Venn diagram below with at least six facts.

Centipedes

Millipedes

Both

Identify two functions of crustaceans’ swimmerets.
1. 
2. 

Summarize helpful functions and problems caused by arthropods.

Helpful Arthropod Functions

Problems Arthropods Cause

Analyze one method of controlling insect pests. Support your reasoning.

144  Mollusks, Worms, Arthropods, Echinoderms
Scan Section 4 of your book. Use the checklist below.

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

Now, write three things that you want to learn about echinoderms.

1. ______________________________________
2. ______________________________________
3. ______________________________________

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

epidermis

**Write a paragraph that explains the meaning and functions of both of the vocabulary terms.**

water-vascular system

tube feet

**Use a dictionary to define network in a way that it might be used in science.**

network
Section 4 Echinoderms (continued)

Main Idea

Echinoderm Characteristics

I found this information on page ________.

Details

Identify characteristics of echinoderms in the chart below.

<table>
<thead>
<tr>
<th>Characteristics of Echinoderms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of symmetry</td>
</tr>
<tr>
<td>Body description</td>
</tr>
<tr>
<td>Where they live</td>
</tr>
</tbody>
</table>

Create a graphic organizer to identify the functions of a watervascular system.

I found this information on page ________.
Classify the types of echinoderms, and identify one characteristic of each in the chart below.

<table>
<thead>
<tr>
<th>Echinoderms</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sea stars</td>
<td>have at least five arms that can regenerate if</td>
</tr>
<tr>
<td></td>
<td>broken off</td>
</tr>
</tbody>
</table>

Summarize four reasons that echinoderms are important to ocean environments.

1. 
2. 
3. 
4. 

Predict in what part of the ocean echinoderms probably live. Support your reasoning.
Mollusks, Worms, Arthropods, Echinoderms  Chapter Wrap-Up

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

<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 ideas that you have learned that you did not know before.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________
Fish, Amphibians, and Reptiles

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>Fish, Amphibians, and Reptiles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• All vertebrates are chordates.</td>
</tr>
<tr>
<td></td>
<td>• Scales can be used to classify fish.</td>
</tr>
<tr>
<td></td>
<td>• The health of amphibians can indicate the health of the environment.</td>
</tr>
<tr>
<td></td>
<td>• Reptiles must lay their eggs in water.</td>
</tr>
</tbody>
</table>

Foldables Study Organizer

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

Science Journal

List two unique characteristics for each animal group you will be studying.
Fish, Amphibians, and Reptiles
Section 1 Chordates and Vertebrates

Scan the headings in Section 1 of your book. Predict three topics that will be discussed.
1. ____________________________
2. ____________________________
3. ____________________________

Define motor responses using your book or a dictionary.

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

- animal that at some point in its development has a notochord, postanal tail, nerve cord, and pharyngeal pouches
- pairs of openings between the mouth and the digestive tube found in developing chordates
- bones that surround and protect the spinal nerve cord
- internal supportive and protective framework found in all vertebrates
- tubelike structure that develops into the brain and spinal cord
- muscular structure at the end of a developing chordate
- flexible, firm structure that extends along the upper part of chordate’s body
- tough, flexible tissue that joins vertebrae and makes up all or part of the vertebrate endoskeleton

Use a dictionary to define external as it might be used in science.
### Chordate Characteristics

*Model* a developing chordate. *Label its* pharyngeal pouches, postanal tail, notochord, *and* nerve cord.

<table>
<thead>
<tr>
<th>Model a developing chordate. Label its pharyngeal pouches, postanal tail, notochord, and nerve cord.</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Model" /></td>
</tr>
</tbody>
</table>

### Summarize

*Summarize how the nerve cord develops in most chordates.*

1. 
2. 
3. 
4. 
5. 
6. 

### Vertebrate Characteristics

*I found this information on page ____________.*

### Distinguish

*List characteristics of vertebrates that nonvertebrates do not have.*

1. [internal framework or endoskeleton](#)  
2.  
3.  
4.  
5.  
6. sometimes have ________________________
Identify the 7 main groups of vertebrates.

Define ectotherm and endotherm. Provide a synonym (or word that means the same) and examples for each.

<table>
<thead>
<tr>
<th>Ectotherm</th>
<th>Endotherm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition:</td>
<td>Definition:</td>
</tr>
<tr>
<td>Synonym:</td>
<td>Synonym:</td>
</tr>
<tr>
<td>Examples:</td>
<td>Examples:</td>
</tr>
</tbody>
</table>

Create a timeline to show when vertebrates, amphibians, reptiles, and mammals first appeared. Use a scale of 500 million years ago to the present time.
Fish, Amphibians, and Reptiles
Section 2 Fish

**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** streamline using your book or a dictionary.

*streamline*

**New Vocabulary**

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

*lateral line*

*fin*

*spawning*

*scales*

*swim bladder*

**Academic Vocabulary**

*Use a dictionary to define detect as it would be used in science.*

*detect*
Main Idea

Fish Characteristics

I found this information on page _________.

Details

Summarize information about structures and functions of fish fins and scales.

Fins are ________________________________

______________________________

______________________________

Scales are ________________________________

______________________________

______________________________

Sequence the steps of fish respiration that take place when a fish obtains oxygen and gets rid of carbon dioxide.

1. A fish takes water into its _________________.

2. Water passes over the _________________, which contain many tiny _________________.

3. _______________ from the water is exchanged with _______________ _______________ from the blood.

4. Water containing _________________ passes out through openings on the sides of the fish.

Compare internal and external fertilization in fish by completing the Venn diagram with at least three facts.

<table>
<thead>
<tr>
<th>Internal</th>
<th>Both</th>
<th>External</th>
</tr>
</thead>
</table>

I found this information on page _________.

Name ___________________________ Date ________________
**Main Idea**

**Types of Fish**

* I found this information on page ________.

**Details**

Organize information about the 3 groups of fish by completing the chart.

<table>
<thead>
<tr>
<th>The Three Groups of Fish</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>Jawless fish</td>
</tr>
<tr>
<td>Jawed cartilaginous fish</td>
</tr>
<tr>
<td>Bony fish</td>
</tr>
</tbody>
</table>

- **Model** the body of a typical bony fish by sketching a cutaway view of one. Label its nostrils, mouth, gills, brain, heart, liver, stomach, intestine, scales, bony vertebrae, *and* swim bladder.

**CONNECT IT**

Analyze how other organisms in a lake might be affected if all the fish living in it disappeared.
Fish, Amphibians, and Reptiles
Section 3 Amphibians

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

1. ____________________________________________
2. ____________________________________________
3. ____________________________________________

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

_____________________________________________________________________________

_____________________________________________________________________________

_____________________________________________________________________________

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

inactivity in hot, dry months

developmental process in which most amphibians change their body form to become adults

time of inactivity and slowed metabolism during cold weather

species whose overall health reflects the health of the ecosystem in which it lives

**Use a dictionary to define contact as it might be used in science. Then write a sentence that includes the term.**

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________

___________________________________________________________________________
Section 3  Amphibians (continued)

**Main Idea**

**Amphibian Characteristics**
*I found this information on page _________.*

**Details**

 Complete *the chart about* amphibians.

<table>
<thead>
<tr>
<th>Amphibians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
</tr>
<tr>
<td>Origin of name</td>
</tr>
<tr>
<td>Examples</td>
</tr>
</tbody>
</table>

**Compare and contrast** amphibian hibernation *with* estivation *by completing* the Venn diagram *with at least four facts.*

**Summarize** amphibian respiration and circulation *in the outline.*

I. Gas exchange
   A. Skin is thin, ____________, and lined with ____________.
   B. Lungs are small and ____________.

II. Three-chambered heart
   A. First chamber ____________
      ____________.
   B. Second chamber ____________
      ____________.
   C. Third chamber ____________
      ____________.

*Fish, Amphibians, and Reptiles* 157
Section 3 Amphibians (continued)

Main Idea

Amphibian Characteristics

I found this information on page ___________.

Details

Sequence reproduction and development in amphibians.

| Eggs are laid in _______ | Eggs hatch into _______ with fins, and fertilized _______. |
| Tadpoles develop legs, _______ | Adults can live on _______. |

Classify amphibians by completing the chart.

<table>
<thead>
<tr>
<th>Amphibian Groups</th>
<th>Frogs and Toads</th>
<th>Salamanders and Newts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeding habits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reproduction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Identify four ways that amphibians are important to humans.

<table>
<thead>
<tr>
<th>Why Amphibians are Important</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Connect It

Think about where amphibians spend their lives. Analyze how this might make them important biological indicators.
Skim Section 4 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 bask using your book or a dictionary.

bask

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

Use a dictionary to define interpret as it might be used in science.

interpret

Name ____________________________ Date ________________

Fish, Amphibians, and Reptiles
Section 4 Reptiles
### Main Idea

**Reptile Characteristics**

*I found this information on page ____________.*

### Details

#### Summarize

**Reptiles by completing the chart.**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description or Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td></td>
</tr>
<tr>
<td>Scales</td>
<td></td>
</tr>
<tr>
<td>Movement</td>
<td></td>
</tr>
<tr>
<td>Body Temperature</td>
<td></td>
</tr>
<tr>
<td>Circulation</td>
<td></td>
</tr>
<tr>
<td>Respiration</td>
<td></td>
</tr>
</tbody>
</table>

#### Model

**The structure of the amniotic egg. Label the embryo, shell, yolk sac, egg membrane, and air space.**
Complete the outline about the major groups of modern reptiles.

I. Lizards
   A. Body:
      1. Jaw has __________________________
      2. Toes have __________________________
   B. Feeding: eat __________________________

II. Snakes
   A. Jaw:
      1. Has joint that __________________________
      2. Lower jaw bone used to __________________________
   B. Have no legs

III. Turtles
   A. Body:
      1. Jaw is __________________________
      2. Shell consists of __________________________
   B. Feeding: eat __________________________

IV. Crocodilians
   A. Body:
      1. Shape is __________________________
      2. Head
         a. Crocodile: __________________________
         b. Alligator: __________________________
         c. Gavial: __________________________
   B. Feeding: eat __________________________

V. The Importance of Reptiles
   A. __________________________
   B. __________________________

Identify three reptile adaptations that help them survive on land.

Identify three reptile adaptations that help them survive on land.
Fish, Amphibians, and Reptiles
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>Fish, Amphibians, and Reptiles</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All vertebrates are chordates.</td>
<td></td>
</tr>
<tr>
<td>• Scales can be used to classify fish.</td>
<td></td>
</tr>
<tr>
<td>• The health of amphibians can indicate the health of the environment.</td>
<td></td>
</tr>
<tr>
<td>• Reptiles must lay their eggs in water.</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 ideas that you have 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>Birds and Mammals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• A bird has a crop instead of a stomach.</td>
</tr>
<tr>
<td></td>
<td>• Wings are important for nonflying birds.</td>
</tr>
<tr>
<td></td>
<td>• Marsupials are mammals that lay eggs.</td>
</tr>
<tr>
<td></td>
<td>• Bats help pollinate flowers.</td>
</tr>
</tbody>
</table>

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

List similar characteristics of a mammal and a bird. What characteristics are different?
Scan the headings in Section 1. Identify three topics that will be discussed.

1. __________________________
2. __________________________
3. __________________________

Define thrust using your book or a dictionary.

thrust

New Vocabulary

Contour feather

Endotherm

Preening

Academic Vocabulary

Use a dictionary to define migrate to reflect its scientific meaning.
migrate
Complete the graphic organizer below with three common bird characteristics.

**Bird Characteristics**

I found this information on page __________.

Summarize how each structure of a bird’s body is adapted for flight. Complete the chart.

<table>
<thead>
<tr>
<th>Adaptations for Flight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptation</td>
</tr>
<tr>
<td>Skeleton</td>
</tr>
<tr>
<td>Contour feathers</td>
</tr>
<tr>
<td>Wings</td>
</tr>
</tbody>
</table>
Main Idea

Body Systems

I found this information on page ________.

Sequence the steps in a bird’s digestive process in the flow chart.

- Food is taken into __________
- Enters ________ unchewed; there it ________________
- Moves to ________, where it is __________
- Moves to ________, where it is __________
- Travels through __________, where nutrients __________

Summarize how birds’ respiratory and circulatory systems provide muscles with sufficient oxygen.

<table>
<thead>
<tr>
<th>Respiratory System</th>
<th>Circulatory System</th>
</tr>
</thead>
</table>

The Importance of Birds

I found this information on page ________.

Summarize three ways birds positively affect human life.

1. __________
2. __________
3. __________

Synthesize It

List at least three products used in homes that come from birds.

__________________________

__________________________

__________________________

__________________________

__________________________

__________________________

__________________________

__________________________
Birds and Mammals
Section 2 Mammals

**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. 

**Review Vocabulary**

Define gland using your book or a dictionary.

<table>
<thead>
<tr>
<th>gland</th>
</tr>
</thead>
</table>

**New Vocabulary**

Use your book to define the following terms.

<table>
<thead>
<tr>
<th>mammary gland</th>
</tr>
</thead>
<tbody>
<tr>
<td>gestation period</td>
</tr>
<tr>
<td>umbilical cord</td>
</tr>
<tr>
<td>carnivore</td>
</tr>
<tr>
<td>herbivore</td>
</tr>
<tr>
<td>omnivore</td>
</tr>
</tbody>
</table>

**Academic Vocabulary**

Use a dictionary to define attach to reflect its scientific meaning.

<table>
<thead>
<tr>
<th>attach</th>
</tr>
</thead>
</table>
Main Idea

Characteristics of Mammals

Create a graphic organizer to identify at least four characteristics of mammals.

Details

Summarize mammal body systems. Write two facts for each.

<table>
<thead>
<tr>
<th>Mammal Body Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System</strong></td>
</tr>
<tr>
<td>Circulatory</td>
</tr>
<tr>
<td>Respiratory</td>
</tr>
<tr>
<td>Nervous</td>
</tr>
<tr>
<td>Digestive</td>
</tr>
</tbody>
</table>
Main Idea

Types of Mammals

I found this information on page ___________.

Importance of Mammals

I found this information on page ___________.

Details

Compare the 3 types of mammals by completing the chart below.

<table>
<thead>
<tr>
<th>Types of Mammals</th>
<th>Type</th>
<th>How Bear Young</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monotremes</td>
<td></td>
<td>give birth to immature young that usually crawl into pouch on female's abdomen</td>
<td>human</td>
</tr>
</tbody>
</table>

Complete the outline below.

A. Mammals help keep balance in the ecosystem
   1. ____________________________________________
   2. ____________________________________________

B. Some mammals are in danger
   1. ____________________________________________
   2. ____________________________________________

CONNECT IT

A drought kills many of the plants upon which the local herbivores rely upon. Might this affect the local carnivores as well? Explain.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Birds and Mammals  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>Birds and Mammals</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A bird has a crop instead of a stomach.</td>
<td></td>
</tr>
<tr>
<td>• Wings are important for nonflying birds.</td>
<td></td>
</tr>
<tr>
<td>• Marsupials are mammals that lay eggs.</td>
<td></td>
</tr>
<tr>
<td>• Bats help pollinate flowers.</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 key facts that you have learned that you did not know before.

____________________________________________________

____________________________________________________

____________________________________________________

170  *Birds and Mammals*
Animal Behavior

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><strong>Before You Read</strong></th>
<th><strong>Animal Behavior</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A bird must learn how to build a nest.</td>
<td></td>
</tr>
<tr>
<td>A gosling follows the first moving object it sees after hatching.</td>
<td></td>
</tr>
<tr>
<td>Some animals may show submissive behavior to prevent another animal from attacking.</td>
<td></td>
</tr>
<tr>
<td>Many animals move to new locations when the seasons change.</td>
<td></td>
</tr>
</tbody>
</table>

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

**Science Journal**

What behaviors might an animal use to signal that a territory is occupied?
Animal Behavior
Section 1 Types of Behavior

**Skim the What You’ll Learn statements in Section 1. Predict three topics that you expect will be discussed in this section.**

1. ________________________________________
2. ________________________________________
3. ________________________________________

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

salivate

**New Vocabulary**

Read the definitions below. Write the correct vocabulary terms on the blanks in the left column.

- way an organism interacts with other organisms and its environment
- behavior that an organism is born with and that does not need to be learned
- animal’s formation of a social attachment to another organism during a specific period following birth or hatching
- modifying behavior so that a response to one stimulus becomes associated with a different stimulus
- form of reasoning that allows animals to use past experiences to solve new problems

**Academic Vocabulary**

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

internal
Main Idea

Behavior

I found this information on page __________.

Details

Complete the flow charts with examples of internal and external stimuli and responses.

<table>
<thead>
<tr>
<th>Stimulus</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>External</td>
<td></td>
</tr>
<tr>
<td>Internal</td>
<td></td>
</tr>
</tbody>
</table>

Innate Behavior

I found this information on page __________.

Identify two types of innate behavior. Define them and provide at least two examples of each.

<table>
<thead>
<tr>
<th>Innate Behaviors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Behavior</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Animal Behavior  173
Learned Behavior

Analyze the importance of learned behavior for animals.

Learned behaviors help animals _________________. Animals that can learn are ________________ than those that cannot. Learned behavior is most commonly found in animals with ___________ life spans.

Summarize four ways behaviors are learned.

<table>
<thead>
<tr>
<th>Behavior Name:</th>
<th>Behavior Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example:</td>
<td>An animal forms a social attachment within a short time after birth or hatching.</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>

Moths move toward light. Cockroaches move away from it. What type of behavior is this? Would these animals be able to change this behavior?
Scan Section 2 by reading the headings and examining the illustrations. Then write three questions that you hope to answer as you read the section. Look for the answers as you read.

1. __________________________________________
2. __________________________________________
3. __________________________________________

Define nectar to show its scientific meaning.

nectar

Define pheromone to show its scientific meaning.

pheromone

Define cyclic behavior to show its scientific meaning.

cyclic behavior

Define migration to show its scientific meaning.

migration

Define dominate to show its scientific meaning.

dominate
Section 2 Behavioral Interactions (continued)

Main Idea

Instinctive Behavior Patterns
I found this information on page _________.

Social Behavior
I found this information on page _________.

Identify two instinctive ritual animal behaviors.
1. ______________________
2. ______________________

Identify three advantages for animals living in groups.

Summarize the key features of a society in the paragraph below.
A society is _____________________________________________________________. Members of societies have specific roles. In societies that are organized by dominance, _____________________________________________________________.

Organize information about territorial behavior. Identify how animals mark their territories and why and how they defend them.

Animal Territories

Identified by: ______________________

Why defended: ______________________

How defended: ______________________
Main Idea

Communication

Classify types of animal communication. Complete the table below.

<table>
<thead>
<tr>
<th>Type of Communication</th>
<th>What It Is</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>behaviors that allow males and females of a species to recognize and mate with each other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animals make sounds to communicate with other animals of the same species.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>firefly giving off a flash of light to attract a mate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cyclic Behavior

Define each of the following cyclic behaviors.

circadian rhythm: ____________________________________________

hibernation: ________________________________________________

estivation: ________________________________________________
Animal Behavior  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>Animal Behavior</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A bird must learn how to build a nest.</td>
<td></td>
</tr>
<tr>
<td>• A gosling follows the first moving object it sees after hatching.</td>
<td></td>
</tr>
<tr>
<td>• Some animals may show submissive behavior to prevent another animal from attacking.</td>
<td></td>
</tr>
<tr>
<td>• Many animals move to new locations when the seasons change.</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 animal behavior.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

178  Animal Behavior
Structure and Movement

Before You Read

Preview the chapter title, section titles, and section headings. Complete the first two columns of the chart by listing at least two ideas for each section in each column.

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

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

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

Science Journal

Imagine that your body did not have a support system. Describe how you might perform your daily activities.
Structure and Movement
Section 1 The Skeletal System

Skim the headings in Section 1. Write three questions that come to mind about bones and joints.

1. 
2. 
3. 

Define skeleton to show its scientific meaning.

Write the correct vocabulary word next to each definition.

smooth, slippery, thick layer of tissue that covers the ends of bones

Use a dictionary to define transfer as a verb.
Section 1 The Skeletal System (continued)

**Main Idea**

**Living Bones**
*I found this information on page __________.*

**Bone Structure**
*I found this information on page __________.*

**Details**

**Organize** information about the functions of the skeletal system. Complete the concept web.

**Summarize** the functions of the following five parts of a bone.

- **Periosteum:**
  - 
  - 
  - 
  - 

- **Compact bone:**
  - 
  - 
  - 
  - 

- **Spongy bone:**
  - 
  - 
  - 
  - 

- **Marrow cavity:**
  - 
  - 
  - 
  - 

- **Cartilage:**
  - 
  - 
  - 
  - 

*Structure and Movement 181*
Suppose that the joints in your shoulders were hinge joints. Evaluate how this would change your daily life.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immovable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pivot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ball-and-socket</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hinge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gliding</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Classify the five types of joints. Describe and give an example of each.

Sequence the steps of bone formation.

1. ____________________________
2. ____________________________
3. ____________________________

Analyze the role of cartilage in bone movement and what happens if bones cannot move smoothly.
Predict three topics that will be covered in Section 2. Read the section headings, and look at the illustrations to help you make your predictions.

1. 

2. 

3. 

Define bone to show its scientific meaning.

bone

Write the correct vocabulary term next to each definition.

involuntary striated muscle found only in the heart

muscle that can be consciously controlled

muscle that moves bones

muscle that cannot be consciously controlled

thick band of tissue that attaches muscles to bones

organ that can relax, contract, and provide the force to move bones and body parts

involuntary, nonstriated muscle found in intestines, bladder, blood vessels, and other organs

Define flexible as an adjective.

flexible
Main Idea

Movement of the Human Body

I found this information on page ________.

Details

Summarize the role of muscles in the body.

Contrast voluntary and involuntary muscles. Complete the chart.

<table>
<thead>
<tr>
<th>Muscle Type</th>
<th>Consciously controlled</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voluntary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involuntary</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model the types of levers found in the human body.

- Draw each type of lever, and label the fulcrum, load, and direction of force.
- Give an example of where the lever is located in the body.

First-class lever

Example: ____________________________________

Second-class lever

Example: ____________________________________

Third-class lever

Example: ____________________________________

Your Body’s Simple Machines—Levers

I found this information on page ________.
Suppose a woman began riding her bike more regularly instead of watching TV. Evaluate what kinds of changes in her leg muscles she might start seeing. Explain why this occurs.

**Classification of Muscle Tissue**

I found this information on page ___________.

**Compare and contrast** the three types of muscle tissue.

<table>
<thead>
<tr>
<th>Type of Muscle</th>
<th>Voluntary or Involuntary</th>
<th>Where Found in the Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skeletal muscle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardiac muscle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smooth muscle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Working Muscles**

I found this information on page ___________.

**Summarize** how muscles work in pairs.

I found this information on page ___________.

**Sequence** how muscles are fueled by filling in the missing words.

Blood carries _________________ to your muscle cells.

When your muscles contract, _________________ from these molecules is converted to _________________ and _________________. When the supply of _________________ in the muscle is _________________, the muscle becomes _________________. As the muscle _________________, blood brings more _________________ to your muscle cells.

**CONNECT IT**

Suppose a woman began riding her bike more regularly instead of watching TV. Evaluate what kinds of changes in her leg muscles she might start seeing. Explain why this occurs.

I found this information on page ___________.

**Structure and Movement**

185
Preview the What You’ll Learn statements for Section 3. Predict three topics that you will study in this section.

1. 
2. 
3. 

Define vitamin to show its scientific meaning.

**vitamin**

**epidermis**

**melanin**

**dermis**

Define each vocabulary term.

**layer**

Use a dictionary to define layer as a noun. Then find a sentence in Section 3 that uses the term.
Main Idea

Your Largest Organ and Skin Structures

Create a cross-section drawing of the skin. Label the following structures.
- blood vessels
- dermis
- epidermis
- fatty layer
- hairs
- hair follicles
- nerve endings
- oil glands
- sweat gland
- sweat pore

Write captions summarizing key facts about the dermis and epidermis.

Dermis:

Epidermis:

Analyze the role of melanin in the body.
Main Idea

Skin Functions
I found this information on page _________.

Details

Distinguish the five primary functions of the skin.

1. 
2. 
3. 
4. 
5. 

Summarize how bruises form.

Sequence the steps as a cut heals.

A cut occurs in the skin. 

CONNECT IT

Analyze why people with severe burns or other damage to large areas of their skin are especially vulnerable to infections. Explain how skin grafts help prevent infections.
Tie It Together

Structure and Movement

*Design a model that shows how the skeletal and muscular systems work together to allow you to bend your elbow. Present your model to the class and explain how it works.*
Structure and Movement
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 now 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

What are the three most important ideas in this chapter?


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>Nutrients and Digestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All foods provide the body with the same amount of energy.</td>
<td></td>
</tr>
<tr>
<td>• What you eat does not affect your health.</td>
<td></td>
</tr>
<tr>
<td>• Sixty percent of your body weight is made up of water.</td>
<td></td>
</tr>
<tr>
<td>• There are bacteria in your digestive tract that make vitamins needed for health.</td>
<td></td>
</tr>
</tbody>
</table>

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

Make a list of all the organs you think are part of your digestive system.
Nutrients and Digestion
Section 1 Nutrition

Skim the headings in Section 1 of this chapter. Write three questions that come to mind.

1. 
2. 
3. 

Define molecule to show its scientific meaning.

molecule

Write a sentence that contains both words in each pair.

nutrient/food group

protein/amino acid

carbohydrate/fat

vitamin/mineral

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

energy
Define calorie by completing the statement below.

Calorie: the amount of heat necessary to _________ the temperature of _________ of water _________.

Complete the graphic organizer with key information about proteins.

I found this information on page _________.

Compare carbohydrates and fats by completing the chart.

<table>
<thead>
<tr>
<th>Carbohydrates</th>
<th>Fats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main function(s)</td>
<td>supply energy; help the body absorb vitamins; cushion internal organs</td>
</tr>
<tr>
<td>Groups</td>
<td>simple</td>
</tr>
<tr>
<td>Examples</td>
<td>vegetable oils, fats found in meat and animal products</td>
</tr>
</tbody>
</table>
Section 1 Nutrition (continued)

Main Idea

I found this information on page ___________.

Details

Classify vitamins by completing the chart.

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Soluble in</th>
<th>Most Beneficial to</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I found this information on page ___________.

Food Groups

I found this information on page ___________.

Summarize why water is an important nutrient.

Model serving size for different food categories.

<table>
<thead>
<tr>
<th>Group</th>
<th>Servings per Day</th>
<th>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</td>
<td></td>
<td></td>
</tr>
<tr>
<td>meat, poultry, fish, beans, eggs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONNECT IT

What is the purpose of the food pyramid?

-------------------

Name __________________________ Date __________________________
Nutrients and Digestion
Section 2 The Digestive System

Preview Section 2 by restating the What You’ll Learn statements as questions. Answer each question as you study.

1. 

2. 

3. 

Define bacteria to show its scientific meaning.

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

- process that breaks down food into small molecules
- breakdown of food through chewing, mixing, and churning
- occurs when chemical reactions break down large molecules of food into smaller ones
- protein that speeds up chemical reactions in the body
- muscular contractions that move food through the digestive tract
- watery liquid released by the stomach to the small intestine
- fingerlike projections covering the wall of the small intestine

Use a dictionary to define area to show its scientific meaning.
Main Idea

Functions of the Digestive System

I found this information on page __________.

Enzymes

I found this information on page __________.

Organs of the Digestive System

I found this information on page __________.

Details

Identify the four stages of processing food that occur in the human body.

1. _______________  3. _______________
2. _______________  4. _______________

Organize information about digestive enzymes.

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>Role in digestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amylase</td>
<td>helps break down proteins</td>
</tr>
<tr>
<td>Pancreatic enzymes</td>
<td></td>
</tr>
</tbody>
</table>

Draw and label the parts of the human digestive system.

- Color the organs through which food passes one color.
- Color the accessory organs another color. Include the: tongue, mouth, rectum, small intestine, pancreas, anus, stomach, gallbladder, liver, large intestine, esophagus, and salivary glands.
Organize information about what happens in the digestive tract.

- List the sections of the digestive tract in the first column.
- Place a checkmark in the appropriate columns showing what occurs in each section.

<table>
<thead>
<tr>
<th>Section of Digestive Tract</th>
<th>What Occurs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mechanical Digestion</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>

Complete the table on two types of essential vitamins made by bacteria in the digestive tract.

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Function in Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin K</td>
<td></td>
</tr>
<tr>
<td>B vitamins</td>
<td></td>
</tr>
</tbody>
</table>

Analyze It

Choose one organ of the digestive system and describe its role in digestion.
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>Nutrients and Digestion</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All foods provide the body with the same amount of energy.</td>
<td></td>
</tr>
<tr>
<td>• What you eat does not affect your health.</td>
<td></td>
</tr>
<tr>
<td>• Sixty percent of your body weight is made up of water.</td>
<td></td>
</tr>
<tr>
<td>• There are bacteria in your digestive tract that make vitamins needed for health.</td>
<td></td>
</tr>
</tbody>
</table>

Review

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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 in the chapter.
# Circulation

## 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</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• The human heart has four chambers.</td>
</tr>
<tr>
<td></td>
<td>• Arteries are blood vessels that carry blood to the heart.</td>
</tr>
<tr>
<td></td>
<td>• Platelets are cell fragments that help fight bacteria and viruses.</td>
</tr>
<tr>
<td></td>
<td>• Lymphatic vessels are like veins in that they have valves.</td>
</tr>
</tbody>
</table>

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

### Science Journal

Infer how the circulatory system provides your body with the nutrients it needs to stay healthy.

_-------_ _-------_ _-------_ _-------_ _-------_ _-------_

_-------_ _-------_ _-------_ _-------_ _-------_ _-------_
Circulation
Section 1 The Circulatory System

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

1. 
2. 
3. 

Define heart using your book or a dictionary.

heart

Read the definitions below. Write the correct vocabulary terms on the blanks in the left column.

two upper chambers of the heart that contract at the same time

two lower chambers of the heart that contract at the same time

flow of blood to and from the tissues of the heart

flow of blood through the heart to the lungs and back to the heart

flow of blood from the heart to all of the organs and body tissues, except the heart and lungs, with oxygen-poor blood returning to the heart

blood vessel that carries blood away from the heart

blood vessel that carries blood back to the heart

microscopic blood vessel that connects arteries and veins

Use a dictionary to define transport as it would be used in science.
Main Idea

How Materials Move Through the Body

I found this information on page __________.

Details

Compare and contrast diffusion and active transport by completing the Venn diagram with at least five facts.

Sequence the stages in pulmonary circulation by completing the flow diagram. Include aorta, pulmonary veins, pulmonary arteries, right atrium, left atrium, and right ventricle.

Summarize the exchange that occurs between a systemic capillary and the tissue cells it serves.
# Section 1 The Circulatory System (continued)

## Main Idea

### Blood Vessels

I found this information on page ________.

### Connect It

A doctor may advise a patient to make lifestyle changes to help prevent cardiovascular disease. Identify several healthful habits the doctor might suggest.

## Details

### Classify blood vessels by completing the chart.

<table>
<thead>
<tr>
<th>Blood Vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td>Arteries</td>
</tr>
<tr>
<td>Capillaries</td>
</tr>
<tr>
<td>Veins</td>
</tr>
</tbody>
</table>

### Define blood pressure and the two numbers used to measure it.

- Blood pressure is ____________.
- First number measures ____________.
- Second number measures ____________.
# Circulation

## Section 2 Blood

**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** blood vessels using your book or a dictionary.

<table>
<thead>
<tr>
<th>blood vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td>________________</td>
</tr>
<tr>
<td>________________</td>
</tr>
<tr>
<td>________________</td>
</tr>
</tbody>
</table>

**New Vocabulary**

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

<table>
<thead>
<tr>
<th>platelet</th>
</tr>
</thead>
<tbody>
<tr>
<td>________________</td>
</tr>
<tr>
<td>________________</td>
</tr>
<tr>
<td>________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>plasma</th>
</tr>
</thead>
<tbody>
<tr>
<td>________________</td>
</tr>
<tr>
<td>________________</td>
</tr>
<tr>
<td>________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>hemoglobin</th>
</tr>
</thead>
<tbody>
<tr>
<td>________________</td>
</tr>
<tr>
<td>________________</td>
</tr>
<tr>
<td>________________</td>
</tr>
</tbody>
</table>

**Academic Vocabulary**

*Use a dictionary to define series as it would be used in science.*

<table>
<thead>
<tr>
<th>series</th>
</tr>
</thead>
<tbody>
<tr>
<td>________________</td>
</tr>
<tr>
<td>________________</td>
</tr>
<tr>
<td>________________</td>
</tr>
</tbody>
</table>
Functions of Blood

Create a graphic organizer with facts about the functions of blood.

Parts of Blood

Summarize information about the parts of blood in the chart below.

<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

Sequence the steps in wound healing by completing the blanks.

________________ stick to the wound and release __________________
________________. Next, __________________ forms a sticky net. The net
traps __________________ and __________________ to form a clot. The
________________ forms a _____________. Then, __________________
form under the _____________. Finally, the ____________ falls off.
Main Idea

Blood Types

I found this information on page __________.

Details

Compare and contrast the 2 sets of chemical identification tags in blood by completing the Venn diagram with at least five facts.

ABO Identification System

Both

Rh Factor

Diseases of Blood

I found this information on page __________.

Identify causes and effects of two diseases of the blood.

Causes
Effects

Anemia
lack of certain vitamins or iron in diet

Leukemia

CONNECT IT

Almost immediately after being born, a baby received a blood transfusion of Rh+ blood. Predict the mother’s Rh factor. Why did the baby need a blood transfusion?
Circulation
Section 3 The Lymphatic System

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

1. 
2. 
3. 

Define smooth muscles using your book or a dictionary.

<table>
<thead>
<tr>
<th>smooth muscles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>lymph</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>lymphatic system</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>lymphocyte</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>lymph node</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Use a dictionary to define occur as it would be used in science.

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

Functions of the Lymphatic System

I found this information on page __________.

Define tissue fluid and describe its relationship to the lymphatic system.

Tissue fluid is ___________.

The lymphatic system collects ___________. While in the lymphatic system, the fluid is called ___________.

Sequence the stages by which lymph travels through the lymphatic system.

Tissue fluid enters a network of ___________.

The ___________ carry lymph to larger ___________.

The ___________ drain into ___________ near the heart.

Summarize how the lymphatic system transports lymph.

Discuss the role of smooth muscles and valves.

I found this information on page __________.
Main Idea

**Lymphatic Organs**

I found this information on page __________.

Model the lymphatic system by drawing it within an outline of the human body. Indicate and label lymph nodes, lymph vessels, lymphatic duct, thoracic duct, tonsils, thymus, and spleen.

Details

Summarize how HIV affects the lymphatic system.

A Disease of the Lymphatic System

I found this information on page __________.

**CONNECT IT**

Analyze why people who have HIV are at higher risk from the flu or pneumonia than people who are HIV-negative?
Tie It Together

A Checklist for Health

You know that a healthy lifestyle is important for the health of your cardiovascular system.

• Work with a partner to develop a checklist of daily actions to protect your cardiovascular health.
• List actions that are beneficial and actions that should be avoided.
• Provide concrete examples.
• Then make a poster using your checklist.
Circulation  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>Circulation</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The human heart has four chambers.</td>
<td></td>
</tr>
<tr>
<td>• Arteries are blood vessels that carry blood to the heart.</td>
<td></td>
</tr>
<tr>
<td>• Platelets are cell fragments that help fight bacteria and viruses.</td>
<td></td>
</tr>
<tr>
<td>• Lymphatic vessels are like veins in that they have valves.</td>
<td></td>
</tr>
</tbody>
</table>

Review
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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 concepts that you have learned about circulation.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

210  Circulation
Respiration and Excretion

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>Respiration and Excretion</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Breathing is the process in which the body obtains oxygen and releases energy from food.</td>
<td></td>
</tr>
<tr>
<td>• The respiratory system contains structures that allow humans to speak.</td>
<td></td>
</tr>
<tr>
<td>• If wastes are not removed from the body, they can build up and damage organs.</td>
<td></td>
</tr>
<tr>
<td>• The bladder filters wastes from blood.</td>
<td></td>
</tr>
</tbody>
</table>

*Foldables*

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

*Science Journal*

How do you think your body adapts to meet your needs while you are playing sports?

---

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Respiration and Excretion

Section 1 The Respiratory System

**Skim** the headings of Section 1. Write questions about the respiratory system that you think will be answered in the section.

1. ____________________________________________
2. ____________________________________________
3. ____________________________________________

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

lungs

________________________________________________________________________

Write four sentences, each containing two of the vocabulary terms. Use each word at least once.

**pharynx**

________________________________________________________________________

**larynx**

________________________________________________________________________

**trachea**

________________________________________________________________________

**bronchi**

________________________________________________________________________

**alveoli**

________________________________________________________________________

**diaphragm**

________________________________________________________________________

**emphysema**

________________________________________________________________________

**asthma**

________________________________________________________________________

**Use a dictionary to define** generate as a verb.

generate

________________________________________________________________________

________________________________________________________________________
Section 1 The Respiratory System (continued)

Main Idea

Functions of the Respiratory System

Classify each process involved in obtaining, transporting, and using oxygen as breathing, circulation, or respiration.

Details

Oxygen is supplied to the body.

Oxygen is transported to body cells.

Body cells use oxygen and release carbon dioxide.

Carbon dioxide is transported to lungs.

Carbon dioxide waste is expelled.

Summarize respiratory system structures and functions by completing the chart.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trachea</td>
<td>take air into and out of lungs</td>
</tr>
<tr>
<td>Alveoli</td>
<td></td>
</tr>
</tbody>
</table>

Organs of the Respiratory System

I found this information on page _________.

I found this information on page _________.
Section 1 The Respiratory System (continued)

Main Idea

Why do you breathe?

I found this information on page

Details

Model the processes of inhaling and exhaling in the boxes below.

<table>
<thead>
<tr>
<th>Inhaling</th>
<th>Exhaling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarize respiratory system diseases and disorders.

<table>
<thead>
<tr>
<th>Disease/Disorder</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory infections</td>
<td>sometimes caused by bacteria; develops when the bronchial tubes are irritated and swell and too much mucus is produced; lasts for a long time</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>disease in which the alveoli enlarge, causing an enzyme that breaks down alveoli walls to be produced; alveoli do not function well and blood receives less oxygen; causes shortness of breath</td>
</tr>
<tr>
<td>Asthma</td>
<td></td>
</tr>
</tbody>
</table>

CONNECT IT

Identify respiratory diseases and disorders described in this chapter that are related to smoking. List symptoms of these diseases.

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________
Respiration and Excretion
Section 2 The Excretory System

Scan the headings and illustrations in Section 2 to determine three processes that are involved in the urinary system’s function.
1. ____________________________________________________________
2. ____________________________________________________________
3. ____________________________________________________________

Review Vocabulary

Define blood to show its scientific meaning.

blood

New Vocabulary

Write a paragraph using all seven of the new vocabulary terms. Try to use sentences that show the meaning of each term.

urinary system

urine

kidney

nephron

ureter

bladder

urethra

Academic Vocabulary

Use a dictionary to define remove.

remove
Complete the following statement with the words provided.

damage  illness  wastes  death  toxic

If ________ are not removed from the body, ________ substances build up and ________ organs. Serious ________ or ________ may occur.

Model the urinary system. Draw and label the organs of the urinary system.

Summarize how blood is processed in the kidneys. Identify substances that pass through the filter and substances that are left behind. Identify the structures involved in each stage.

First stage: _______________________________________

________________________________________________________________________

________________________________________________________________________

Second stage: _______________________________________

________________________________________________________________________

________________________________________________________________________
Section 2 The Excretory System (continued)

**Main Idea**

I found this information on page __________.

**Details**

**Sequence the structures of the urinary system.**

bladder  kidney  ureter  urethra

1. ________  2. ________  3. ________  4. ________

**Summarize other processes of excretion.**

__________________________

__________________________

__________________________

**Analyse the effects of each urinary system problem.**

Salt imbalance

Blockage of the ureters and urethra

**Identify information about the diagnoses of urinary diseases.**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Method of Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary tract disease</td>
<td>change in the urine’s color</td>
</tr>
<tr>
<td>Diabetes</td>
<td>increased amounts of albumin</td>
</tr>
</tbody>
</table>

**CONNECT IT**

Describe how blood helps rid the body of wastes.

__________________________
Respiration and Excretion
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>Respiration and Excretion</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Breathing is the process in which the body obtains oxygen and releases energy from food.</td>
<td></td>
</tr>
<tr>
<td>• The respiratory system contains structures that allow humans to speak.</td>
<td></td>
</tr>
<tr>
<td>• If wastes are not removed from the body, they can build up and damage organs.</td>
<td></td>
</tr>
<tr>
<td>• The bladder filters wastes from blood.</td>
<td></td>
</tr>
</tbody>
</table>

Review
Use this checklist to help you study.

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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 processes of excretion described in this chapter.
Control and Coordination

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>Control and Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td>• You are subjected to thousands of stimuli every day.</td>
<td></td>
</tr>
<tr>
<td>• The brain is made up of about 10,000 neurons.</td>
<td></td>
</tr>
<tr>
<td>• You can’t control reflexes because they occur before you know what has happened.</td>
<td></td>
</tr>
<tr>
<td>• You can smell food because it gives off molecules into the air.</td>
<td></td>
</tr>
</tbody>
</table>

*FOLDABLES Study Organizer*

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

*SCIENCE JOURNAL*

**Which senses do you think are involved when you respond to a glass crashing on a tile floor?**

---

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**Control and Coordination**

**Section 1 The Nervous System**

**Scan** the headings in Section 1 of your book. Write three questions that come to mind.

1. 
2. 
3. 

**Define** response using its scientific meaning.

**response**

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

**homeostasis**

**neuron**

**synapse**

**reflex**

**central nervous system**

**peripheral nervous system**

**coordinate** Use a dictionary to define coordinate using its scientific meaning.
Main Idea

How the Nervous System Works

I found this information on page ___________.

Details

Define stimulus and describe the relationship between stimuli and the nervous system.

Sequence the passage of an impulse through a nerve cell. Start with receiving the impulse at a dendrite and end with the part of the nerve cell that carries the impulse to muscles, neurons, and glands.

Nerve Cells

I found this information on page ___________.

The Central Nervous System

I found this information on page ___________.

Organize information about the parts of the brain and their functions by completing the chart below.

<table>
<thead>
<tr>
<th>Part of the brain</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cerebrum</td>
<td></td>
</tr>
<tr>
<td>Cerebellum</td>
<td></td>
</tr>
<tr>
<td>Brain stem</td>
<td></td>
</tr>
</tbody>
</table>

Describe the function of the spinal cord.

Spinal cord: __________________________________________
Main Idea

The Peripheral Nervous System
I found this information on page ___________.

Safety and the Nervous System
I found this information on page ___________.

Drugs and the Nervous System
I found this information on page ___________.

Details

Compare and contrast the two major parts of the peripheral nervous system by completing the graphic organizer below.

Peripheral Nervous System

- Parts
- Functions

Analyze the diagram of the reflex arc provided in your book. List in order the three neurons involved in the reflex pathway, or arc.
1. __________
2. __________
3. __________

Distinguish between alcohol and caffeine by completing the Venn diagram with at least two facts for each drug.

Alcohol

Both

Caffeine

Infer why alcohol is a controlled substance and caffeine is not.

CONNECT IT

Infer why alcohol is a controlled substance and caffeine is not.
Control and Coordination
Section 2 The Senses

**Skim** the headings of Section 2 to determine the four senses that will be discussed in detail.

1. 
2. 
3. 
4. 

**Define** sense organ using a dictionary or your book.

**sense organ**

**Write the correct vocabulary term beside the definition.**

- light-sensitive tissue at the back of the eye; contains rods and cones
- fluid-filled structure in the inner ear in which sound vibrations are converted into nerve impulses that are sent to the brain
- nasal nerve cells that become stimulated by molecules in the air and send impulses for interpretation of odors
- major sensory receptor on the tongue; contains taste hairs that send impulses for interpretation of tastes

**Use a dictionary to define interpret. Use the term in a sentence to show its scientific meaning.**

**interpret**
Section 2 The Senses (continued)

Main Idea

The Body’s Alert System

I found this information on page _________.

Vision

I found this information on page _________.

Hearing

I found this information on page _________.

Details

Create a graphic organizer to identify three common stimuli that the senses are able to detect.

Identify the functions of each part of the eye.

<table>
<thead>
<tr>
<th>Part of Eye</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornea</td>
<td></td>
</tr>
<tr>
<td>Lens</td>
<td></td>
</tr>
<tr>
<td>Retina</td>
<td></td>
</tr>
<tr>
<td>Optic nerve</td>
<td></td>
</tr>
</tbody>
</table>

Sequence the parts of the ear in the order that a signal travels.

outer ear → cochlea
Section 2  The Senses (continued)

**Main Idea**

**Smell**

I found this information on page __________.

**Taste**

I found this information on page __________.

**Other Sensory Receptors in the Body**

I found this information on page __________.

**Details**

**Summarize** how food is smelled by the nose.

**Distinguish** the five kinds of tastes in the graphic organizer below.

**Summarize** the kinds of stimuli to which the receptors in internal organs and in fingertips can respond by listing them below.

<table>
<thead>
<tr>
<th>Internal Organs</th>
<th>Fingertips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**EVALUATE IT**

Identify some advantages of having fingertips and skin with many types of receptors for touch.

________________________

________________________

________________________

________________________

________________________
Control and Coordination
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>
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<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>• The brain is made up of about 10,000 neurons.</td>
<td></td>
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<td></td>
</tr>
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<td></td>
</tr>
</tbody>
</table>

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

Summarize It
Describe how your nervous system helps protect you.
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.
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

Define hormone to show its scientific meaning.

hormone

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

distribute
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>
</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
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 ________.

_______ responds to ________ level by producing the hormone ________.

_______ level in ________ increases.

_______ level in bloodstream decreases to normal level in bloodstream.

_______ is restored.

A meal is eaten.
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.

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</td>
<td></td>
</tr>
<tr>
<td>(if fertilized egg does not arrive)</td>
<td></td>
</tr>
</tbody>
</table>

Describe how the menstrual cycle would differ in phase 3 if the egg were fertilized. Then infer how future cycles would be affected.

Describe how the menstrual cycle would differ in phase 3 if the egg were fertilized. Then infer how future cycles would be affected.
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.

Define the new vocabulary terms to show their scientific meaning.

Define capable. Use capable in an original sentence to show its scientific meaning.
Main Idea

Fertilization
I found this information on page ___________.

Details

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.

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.

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.

<table>
<thead>
<tr>
<th>Weeks of Pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

Section 3 Human Life Stages (continued)

Multiple Births
I found this information on page ___________.

Development
Before Birth
I found this information on page ___________.

Name __________________ Date ______________
Main Idea

**The Birthing Process**

I found this information on page __________.

Details

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Contractions increase.</td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
</tr>
</tbody>
</table>

**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>
Tie It Together

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>
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<td>• Identical twins are not always the same sex.</td>
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</tr>
<tr>
<td>• Adulthood is the final stage of human development.</td>
<td></td>
</tr>
</tbody>
</table>

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SUMMARIZE IT

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

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>Immunity and Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Your skin is one of your body’s first lines of defense against disease.</td>
<td></td>
</tr>
<tr>
<td>• A vaccine is given to cure a disease.</td>
<td></td>
</tr>
<tr>
<td>• AIDS and HIV are the same thing.</td>
<td></td>
</tr>
<tr>
<td>• You can catch diabetes from another person.</td>
<td></td>
</tr>
</tbody>
</table>

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

Science Journal

Write a paragraph describing a battle between your white cells and a foreign invader.
Immunity and Disease
Section 1 The Immune System

Read the title and headings of the section. Predict two topics that will be discussed in this section.
1. ____________________________________________________________
2. ____________________________________________________________

Define enzyme to show its scientific meaning.

complex group of defenses that protects the body against pathogens
molecule that is foreign to the body
protein made in response to a specific antigen
immunity in which the body makes its own antibodies in response to an antigen
immunity in which antibodies that have been produced in another animal are introduced to the body
process of giving a vaccine by injection or by mouth

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

______________________________________________________________
Main Idea

Lines of Defense

I found this information on page __________.

Details

Summarize your body’s first-line defense strategies.

Skin

Respiratory System

First-line Defenses

Digestive System

Circulatory System

I found this information on page __________.

Sequence what happens when an antigen enters the body.

1.

2.

3.

4.

5.
Contrast active and passive immunity. Complete the chart.

<table>
<thead>
<tr>
<th></th>
<th>Active Immunity</th>
<th>Passive Immunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>What It Is</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How You Get It</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How Long It Lasts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarize how a vaccine helps protect your body against a pathogen. Complete the flow chart.

A vaccine is injected or given by mouth.

CONNECT IT
Many schools require children to be vaccinated against diseases such as measles before they begin school. Analyze why the schools might have this requirement.
Skim Section 2. Write three questions you would like to have answered. Then look for the answers as you read.

1. 

2. 

3. 

Define protist using your book or a dictionary.

protist

Use your book to define each vocabulary term.

Pasteurization

Use a dictionary to define complex using its scientific meaning.

complex
Distinguish the important contributions of Louis Pasteur, Robert Koch, and Joseph Lister to the treatment of infectious diseases.

Pasteur: ____________________________

Koch: ______________________________

Lister: ____________________________

Identify examples of diseases caused by each type of organism.

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Diseases Caused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacteria</td>
<td></td>
</tr>
<tr>
<td>Protists</td>
<td></td>
</tr>
<tr>
<td>Fungi</td>
<td></td>
</tr>
<tr>
<td>Viruses</td>
<td></td>
</tr>
</tbody>
</table>

Identify four ways in which diseases can be transmitted.

1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
Main Idea

Sexually Transmitted Diseases

I found this information on page _________.

Details

Identify examples of each type of sexually transmitted disease and list its symptoms and possible effects.

- **Disease:** gonorrhea or chlamydia
  - Symptoms:
  - Effects:

Bacterial

- **Disease:** syphilis
  - Symptoms:
  - Effects:

Viral

- **Disease:** genital herpes
  - Symptoms:
  - Effects:

HIV and Your Immune System

I found this information on page _________.

Analyze how HIV harms the immune system. Explain how HIV causes AIDS and what happens when a person has AIDS.

---

Summarize It

Describe several things that you can do to prevent infections.

---
**Immunity and Disease**

**Section 3 Noninfectious Diseases**

Scan the section headings, bold words, and illustrations in Section 3. Write two facts you discovered as you scanned the section.

1. ________________________________________________

2. ________________________________________________

**Review Vocabulary**

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

**gene**

Define each vocabulary term using your book.

**noninfectious disease**

**allergy**

**allergen**

**chemotherapy**

**Academic Vocabulary**

Use a dictionary to define react. Then write what you predict reaction means. Check your definition in the dictionary.

**react**
### Main Idea

#### Chronic Disease

_I found this information on page _____________._

#### Allergies

_I found this information on page _____________._

#### Diabetes

_I found this information on page _____________._

### Details

**Contrast** infectious disease _and_ noninfectious disease.

**Sequence** _what happens during an allergic reaction._ _Then list some typical symptoms of an allergy._

An ______________ enters the body.

**Typical symptoms:**

**Compare and contrast** Type 1 _and_ Type 2 diabetes. _Complete the chart._ _Then list common symptoms of both types of diabetes and the possible long-term effects of the disease._

<table>
<thead>
<tr>
<th>tor</th>
<th>Type 1</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Symptoms:**

**Long-term effects:**

---

*Immuinity and Disease* 247
Main Idea

Chemicals and Disease
I found this information on page _________.

Cancer
I found this information on page _________.

Details

Identify the possible harmful effects of the chemicals listed.
Asbestos: _______________________________
Lead-based paints: _______________________
Alcohol: ________________________________

Summarize information about cancer cells below.

Summarize the causes, warning signs, and treatments of cancer.
Complete the chart.

<table>
<thead>
<tr>
<th>Causes</th>
<th>Warning Signs</th>
<th>Treatments</th>
</tr>
</thead>
</table>

CONNECT IT

A friend’s family has a history of lung and skin cancer. Evaluate some steps your friend could take to reduce his risk of getting these diseases.

Name ___________________________ Date _____________

Section 3 Noninfectious Diseases (continued)
Every winter, many students miss school as a result of colds, influenza, and other infectious diseases. Plan a campaign for your school to teach other students how to reduce their risk of catching these diseases. You might design posters, plan an assembly, or use other ways to get the information out. Outline your plan below.
Immunity and Disease 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>Immunity and Disease</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Your skin is one of your body’s first lines of defense against disease.</td>
<td></td>
</tr>
<tr>
<td>• A vaccine is given to cure a disease.</td>
<td></td>
</tr>
<tr>
<td>• AIDS and HIV are the same thing.</td>
<td></td>
</tr>
<tr>
<td>• You can catch diabetes from another person.</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

What are the three most important ideas in this chapter?
Interactions of Life

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 Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>The community includes the top part of Earth's crust, water that covers Earth's surface, and Earth's atmosphere.</td>
<td></td>
</tr>
<tr>
<td>In nature, most competition occurs between individuals of the same species.</td>
<td></td>
</tr>
<tr>
<td>Plants and microscopic organisms can move from place to place.</td>
<td></td>
</tr>
<tr>
<td>Living organisms do not need a constant supply of energy.</td>
<td></td>
</tr>
</tbody>
</table>

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

Science Journal

Describe how a familiar bird, insect, or other animal depends on other organisms.
Interactions of Life
Section 1 Living Earth

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

1. ____________________________
2. ____________________________
3. ____________________________

Define adaptation using your book or a dictionary.

adaptation

Define each new vocabulary term using your book.

biosphere

ecology

population

community

habitat

Define interact using a dictionary.
Complete this chart to identify three parts of the biosphere.

Contrast the organisms found in different environments as you complete the concept map. Provide examples of both plants and animals.

Analyze the amount of solar energy that makes Earth the only planet known to support life. Explain why other planets are not suitable for life.
Main Idea

**Ecosystems**

Organize the parts of a prairie ecosystem. List three living organisms and three nonliving parts of the ecosystem.

![Diagram of Ecosystem]

**Populations**

Sequence the four levels of organization of living organisms from smallest to largest. Then write an example of each one.

- community
- organism
- ecosystem
- population

<table>
<thead>
<tr>
<th>Smallest</th>
<th>Largest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>community organism ecosystem population</td>
</tr>
</tbody>
</table>

SYNTHESIZE IT

Write about your own life. Use the terms habitat, community, population, and ecosystem to describe your everyday interactions.
### Interactions of Life

**Section 2 Populations**

<table>
<thead>
<tr>
<th><strong>Predict</strong></th>
<th>Read the headings in Section 2. Predict three topics that you think will be discussed in this section.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Define</strong></th>
<th><strong>natural selection</strong> using your book or a dictionary. Then use it in a sentence to show its scientific meaning.</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><strong>Create an original sentence using each vocabulary term to show its scientific meaning.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>limiting factor</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

| **carrying capacity**                        |
|                                               |
|                                               |
|                                               |

<table>
<thead>
<tr>
<th><strong>Define resource using a dictionary. Then write a sentence related to the topic of Section 2 using the term.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>resource</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Complete the chart below to identify how competing for certain limited resources can affect population growth.

<table>
<thead>
<tr>
<th>Limited Resource</th>
<th>Why It Limits Population Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compare the two ways of measuring populations by filling in the graphic organizer below.

Contrast carrying capacity and biotic potential. Then identify one factor that can limit each.

<table>
<thead>
<tr>
<th>What It Is</th>
<th>Limiting Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrying capacity</td>
<td></td>
</tr>
<tr>
<td>Biotic potential</td>
<td></td>
</tr>
</tbody>
</table>
Section 2 Populations (continued)

**Main Idea**

**Changes in Populations**

Compare the effect of differing birth rates and death rates on population growth as you complete the chart below.

<table>
<thead>
<tr>
<th>Population Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth Rate Compared to Death Rate</td>
</tr>
<tr>
<td>much higher</td>
</tr>
<tr>
<td>slightly higher</td>
</tr>
<tr>
<td>lower</td>
</tr>
</tbody>
</table>

Evaluate the effects of exponential growth on a population.

Summarize the environmental effects of the exponential growth of a population.

Synthesize It

A field is crowded with mice. A new group of mice migrate into the field. Describe how the crowded conditions could affect the mice.
Interactions of Life
Section 3 Interactions Within Communities

Scan the What You’ll Learn statements for Section 3. Rewrite each statement as a question. As you read the section, try to answer your questions.

1. 
2. 
3. 

Define social behavior using your book or a dictionary.

Label each definition with the correct vocabulary term.

- an organism that can use an outside energy source like the Sun to make energy-rich molecules
- an organism that cannot make its own energy-rich molecules
- any close relationship between species
- an organism’s role in its environment

Define constant as an adjective. Then use it in a scientific sentence.
Main Idea

Obtaining Energy

I found this information on page __________.

Symbiotic Relationships

I found this information on page __________.

Details

Compare and contrast producers and consumers by describing the processes by which each group gets the energy it needs.

Producers gain energy from

processes that producers use to make food

Consumers gain energy from
different types of consumers

Herbivores eat

Decomposers consume

Carnivores eat

Omnivores eat

Classify examples of symbiosis by completing the chart below.

<table>
<thead>
<tr>
<th>Type of Symbiosis</th>
<th>Who Benefits?</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>mutualism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>commensalism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>parasitism</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Main Idea

Niches
I found this information on page _________.

Details

Organize important points about niches by creating an outline of your reading.

I. A niche is _____________________________.
   A. how it obtains food
   B. _____________________________.
   C. _____________________________.
   D. _____________________________.
   E. _____________________________.

II. Special adaptations that _____________________________.
    can be part of a niche.
    A. Example:
        _____________________________.
        _____________________________.
    B. Example:
        _____________________________.
        _____________________________.

Synthesize It

Draw and label organisms that are in your food chain. Include at least three organisms. Then show how each of these organisms can get the energy it needs.
Observe the behaviors of a species of animal (for example, squirrels in a park) for at least 15 minutes. Use the chart below to take notes on your observations.

<table>
<thead>
<tr>
<th>Species:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date and time of observation:</td>
</tr>
<tr>
<td>Number of individuals observed:</td>
</tr>
<tr>
<td>Interactions within species:</td>
</tr>
<tr>
<td>Food sources observed:</td>
</tr>
<tr>
<td>Habitat:</td>
</tr>
<tr>
<td>Special adaptations of species:</td>
</tr>
<tr>
<td>Interactions observed with other species:</td>
</tr>
</tbody>
</table>
Interactions of Life  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>Interactions of Life</th>
<th>After You Read</th>
</tr>
</thead>
<tbody>
<tr>
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<td>• In nature, most competition occurs between individuals of the same species.</td>
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<td></td>
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</table>

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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 among living organisms.

________________________________________
________________________________________
________________________________________
________________________________________

262  Interactions of Life
The Nonliving Environment

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

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

Science Journal

List all the nonliving things that you might see in a picture of a beach, in order of importance. Explain your reasoning for the order you choose.

---

List all the nonliving things that you might see in a picture of a beach, in order of importance. Explain your reasoning for the order you choose.
The Nonliving Environment
Section 1 Abiotic Factors

Preview the What You’ll Learn statements for Section 1. Rewrite each statement into a question.

1. __________________________________________________________________________
2. __________________________________________________________________________
3. __________________________________________________________________________

Define environment to show its scientific meaning.

environment

Define the following terms to show their scientific meanings.

biotic

abiotic

atmosphere

soil

climate

Use a dictionary to define fundamental as an adjective.

fundamental
Section 1 Abiotic Factors (continued)

Main Idea

Environmental Factors

Classify seven environmental factors as biotic or abiotic.

<table>
<thead>
<tr>
<th>Factors needed for life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biotic</td>
</tr>
<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>
</tbody>
</table>

Compare and contrast how gases are used during photosynthesis and respiration.

<table>
<thead>
<tr>
<th></th>
<th>Photosynthesis</th>
<th>Respiration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas released</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purpose</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summarize how organisms use water and soil. Complete the sentences.

Most organisms are ____________ percent water. Processes such as ____________, ____________, and ____________ need water to occur. Environments with plenty of water usually have ________________ of organisms than environments with little water. Organisms also need _____________. ____________, ____________, ____________, and ____________ all live in soil. The type of soil influences the types of ____________ that can grow in a region.

Air

I found this information on page ____________.

Water and Soil

I found this information on page ____________.
Main Idea

Sunlight
I found this information on page __________.

Temperature
I found this information on page __________.

Climate
I found this information on page __________.

Details

Label the diagram to show the flow of energy through living things. Label consumers, producers, and sunlight.

Analyse how latitude and elevation affect temperature.
Latitude: ____________________________  
______________________________  
______________________________  

Elevation: ____________________________  
______________________________  
______________________________  

Sequence steps to explain the rain shadow effect.

1. Moist air is forced upward by a mountain.

2. ____________________________  

3. ____________________________  

4. ____________________________  

Connect It
Describe the climate of your community. Identify its latitude, elevation, temperature, and precipitation characteristics.
The Nonliving Environment
Section 2  Cycles in Nature

Skim the headings and illustrations in Section 2. List three kinds of cycles you will learn about in the section.

1. 
2. 
3. 

Define biosphere to show its scientific meaning.

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

model describing how carbon molecules move between the living and the nonliving world

process that takes place when a gas changes to a liquid

process in which some types of bacteria in the soil change nitrogen gas into a form of nitrogen that plants can use

process that takes place when a liquid changes to a gas

model describing how water moves from Earth's surface to the atmosphere and back again through evaporation, condensation, and precipitation

model describing how nitrogen moves from the atmosphere to the soil, to living organisms, and then back to the atmosphere

Define model as it is used in the definitions above. Use a dictionary to help you.
Summarize the importance of cycles to life on Earth.

Model the water cycle in a drawing.
- Label phases of the cycle including evaporation, transpiration, condensation, and precipitation.
- Label the sources and forms the water takes.
- Use arrows to show the direction in which water is moving at each part of the cycle.

Identify the three ways that nitrogen is made available to plants.

Plants use nitrogen compounds to build cells.
Describe how harvesting removes soil nitrogen and how fertilizer and nitrogen-fixing crops can increase the amount of nitrogen in soil.

Harvesting:

Fertilizer:

Nitrogen-fixing crops:

Model the carbon cycle. Identify the role of each item shown in the cycle. Draw arrows showing the flow of carbon through the system.

Air

Burning wood and fossil fuels

Producers (Plants and algae)

Consumers

Connect It Choose an organism. Explain its role in the water, nitrogen, and carbon cycles.
The Nonliving Environment
Section 3 Energy Flow

**Skim** Section 3 of your book. Read the headings and look at the illustrations. Write three questions that come to mind.

1. 

2. 

3. 

**Review Vocabulary**

Define *energy* to show its scientific meaning.

- *energy*

**New Vocabulary**

Define the following terms to show their scientific meanings.

- *chemosynthesis* 

- *food web* 

- *energy pyramid* 

**Academic Vocabulary**

Use a dictionary to locate the scientific meaning of *convert*. Write a sentence using that scientific meaning.

- *convert* 

*The Nonliving Environment*
Compare and contrast photosynthesis and chemosynthesis. Complete the Venn diagram with at least seven points of information from your book.

Photosynthesis

Both

Chemosynthesis

Energy Transfer

Create an example of a food chain.

- Include and label a producer, a herbivore, and a carnivore or omnivore that eats the herbivore.
- Use arrows to show the transfer of energy.
**Main Idea**

I found this information on page _______.

**Details**

**Synthesize** information about food webs. Draw arrows to show the energy transfers in the food web shown.

- eagle
- rattlesnake
- weasel
- mouse
- squirrel
- plants

**Energy Pyramids**

I found this information on page _______.

**Sequence** the levels of an energy pyramid.

- Label each level as containing carnivores, herbivores, or producers.
- Label each level with the percentage of total energy that is available at that level.

**SYNTHESIZE IT**

Describe the flow of matter and energy in a food chain made up of grasses, mice, and hawks, and what might happen to the food chain if a fire destroyed much of the grass.
Tie It Together

A developer wants to build homes on land near your community and wants to know how the environment will affect the people who live in the homes, and how the homes will affect the environment.

Prepare an environmental study for the developer, including information about

• the abiotic factors in the area that could affect the people in the home
• how the new homes might affect natural cycles and food webs in the area

Use paragraphs and/or pictures to help you explain your points.
The Nonliving Environment
Chapter Wrap-Up

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

<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>

Write three things that you learned while studying this chapter.

S U M M A R I Z E  I T
Write three things that you learned while studying this chapter.

---

274  The Nonliving Environment
Ecosystems

Before You Read

Think about the terms and descriptions below. Infer which term most closely matches the description and write it on the line.

<table>
<thead>
<tr>
<th>biome</th>
<th>ecosystem</th>
<th>estuary</th>
<th>intertidal zone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>community of living organisms interacting with each other and their physical environment</td>
<td>part of the shoreline that is under water at high tide and exposed to the air at low tide</td>
<td>a large geographic area with an interactive environmental community and similar climate</td>
</tr>
</tbody>
</table>

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

Science Journal

What traits might plants on a burning hillside have that enable them to survive and reproduce?

[Blank lines for writing]
Ecosystems
Section 1 How Ecosystems Change

Skim through Section 1 of your text. Write three things that might be discussed in this section.
1. ________________________________
2. ________________________________
3. ________________________________

Define the following key terms using your book or a dictionary.

ecosystem

climax community

pioneer species

succession

stable

Ecosystems
**Main Idea**

Ecological Succession

I found this information on page __________.

**Details**

**Sequence** the steps in the succession of a lawn to a climax community. The first one has been completed for you.

<table>
<thead>
<tr>
<th>Succession of a Lawn to Climax Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The grass would get longer.</td>
</tr>
<tr>
<td>2.</td>
</tr>
<tr>
<td>3.</td>
</tr>
<tr>
<td>4.</td>
</tr>
<tr>
<td>5.</td>
</tr>
</tbody>
</table>

**Organize** the information from your book to compare primary succession with secondary succession.

<table>
<thead>
<tr>
<th>Primary Succession</th>
<th>Secondary Succession</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lava from a volcano</td>
<td>Fire consumes a forest</td>
</tr>
<tr>
<td>Land consists of _______</td>
<td></td>
</tr>
<tr>
<td>Starts with ___________</td>
<td>Soil contains __________</td>
</tr>
<tr>
<td>rock and decay, adding</td>
<td></td>
</tr>
<tr>
<td>______________________</td>
<td></td>
</tr>
<tr>
<td>Animals and wind</td>
<td></td>
</tr>
<tr>
<td>carry</td>
<td></td>
</tr>
<tr>
<td>Plants add</td>
<td></td>
</tr>
<tr>
<td>Wildlife</td>
<td></td>
</tr>
</tbody>
</table>
Complete the graphic organizer to better understand the characteristics of a climax community.

I found this information on page __________.

Identify the three main characteristics of a forest climax community.

1. ____________________________
2. ____________________________
3. ____________________________

CONNECT IT
Use the information you have learned about succession to predict the growth of a community in a flooded river basin. Hypothesize whether the succession would be primary succession or secondary succession. Support your answer with facts from your book.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Analyze Look at the world map of the seven major land biomes in your book. Infer two factors you think scientists might use to classify biomes of the world.

1. ____________________________

2. ____________________________

Use the word climate in a scientific sentence.

____________________________

____________________________

Define Read the definitions below. Write the key terms on the blanks in the left column.

most biologically diverse biome

ideal biome for growing crops and raising cattle and sheep

biome usually having four distinct seasons

cold, dry, treeless biome with a short growing season and permafrost

biome with thin soil where organisms are adapted to survive extreme conditions

biome containing cone-bearing evergreen trees and dense forests

Use a dictionary to define mature as a verb.

____________________________

____________________________

I found this information on page ___________.

Name ___________________________ Date __________________

Ecosystems

Section 2 Biomes

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Ecosystems 279
Complete the comparison chart using the world map of seven biomes.

<table>
<thead>
<tr>
<th>Major Biomes</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tundra</strong></td>
<td><strong>Plants:</strong></td>
</tr>
<tr>
<td></td>
<td>less than 25 cm per year</td>
</tr>
<tr>
<td></td>
<td><strong>Animals:</strong></td>
</tr>
<tr>
<td><strong>Taiga</strong></td>
<td><strong>Plants:</strong></td>
</tr>
<tr>
<td></td>
<td>temperature range: $-54^\circ C$ to $21^\circ C$</td>
</tr>
<tr>
<td></td>
<td><strong>Animals:</strong></td>
</tr>
<tr>
<td><strong>Temperate Deciduous Forest</strong></td>
<td><strong>Plants:</strong></td>
</tr>
<tr>
<td></td>
<td>eastern US, Europe, parts of Asia and Africa</td>
</tr>
<tr>
<td></td>
<td><strong>Animals:</strong></td>
</tr>
<tr>
<td><strong>Temperate Rain Forest</strong></td>
<td><strong>Plants:</strong></td>
</tr>
<tr>
<td></td>
<td>dense forest with a variety of plants and animals</td>
</tr>
<tr>
<td></td>
<td><strong>Animals:</strong></td>
</tr>
</tbody>
</table>
### Main Idea

<table>
<thead>
<tr>
<th>Physical Description</th>
<th>Average Precipitation</th>
<th>Temperature</th>
<th>Location</th>
<th>Plant and Animal Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tropical Rain Forest</td>
<td></td>
<td></td>
<td></td>
<td>4 zones of plant and animal life Plants:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Animals:</td>
</tr>
<tr>
<td>Desert</td>
<td></td>
<td>mild to hot</td>
<td>western US and S. America, Africa, parts of Australia and Asia</td>
<td>Plants:</td>
</tr>
<tr>
<td>Grasslands</td>
<td>mild to hot</td>
<td></td>
<td></td>
<td>Animals:</td>
</tr>
</tbody>
</table>

### CONNECT IT

Analyze the information you recorded about biomes. Compare and contrast the tundra with the desert.
Ecosystems
Section 3 Aquatic Ecosystems

Read the What You’ll Learn objectives of Section 3. Write questions that come to mind from reading these statements.

1. 

2. 

3. 

Define the key terms using your book or a dictionary.

aquatic 

New Vocabulary
coral reef 

wetland 

Academic Vocabulary
promote 

Freshwater Ecosystems
I found this information on page __________.

Organize the four important factors that determine how well a species can survive in an aquatic environment.

1. 

2. 

3. 

4.
Compare fast-moving streams with slower-moving streams as you complete the sentences below about freshwater environments.

**Fast-moving Streams**
- Currents quickly ____________________________
- ____________________________
- As water tumbles, air ____________________________
- These streams have clearer _________________ and higher _________________.

**Slow-moving Streams**
- Water moves slowly and debris ____________________________
- These environments have higher _________________, more _________________, and organisms ____________________________

Classify each statement as a characteristic of pond ecosystems, lake ecosystems, or both. Mark P for pond, L for lake, or B for both ecosystems.

- _____ more plants than flowing water environments
- _____ deeper water and colder water temperatures
- _____ larger body of water
- _____ plankton floating near the surface
- _____ ecosystem high in nutrients
- _____ small, shallow body of water
- _____ lower light levels at depth limit types of organisms
- _____ plant growth limited to shallow water near shore
- _____ water hardly moves
Main Idea

Freshwater Ecosystems

I found this information on page __________.

Details

Organize information about wetlands in the concept map.

Wetlands

- filled with
- also known as
- located between __________ and __________
- animals may include __________
- source of products such as __________

Complete the outline about saltwater ecosystems.

I. Coral Reef ecosystems are __________
   - reefs formed by __________
   - damaged by __________

II. Seashores
   - affected by __________ and __________
   - intertidal zone organisms must adapt to __________, __________, and __________ changes

III. Estuaries
   - contain __________
   - are important for __________
Tie It Together

Interactions within Ecosystems

Select one of the ecosystems discussed in this chapter. You might choose a tundra ecosystem, a rain forest ecosystem, a coral reef ecosystem, or one of the other ecosystems. Take notes about your ecosystem on the lines below. Then, draw a picture of your ecosystem with its animal and plant inhabitants. Show any interactions that you described in your picture.

My ecosystem is a/an _________________________________.

It includes these plants:

_________________________________________________

_________________________________________________

It includes these animals:

_________________________________________________

_________________________________________________

Its environment includes these conditions:

_________________________________________________

_________________________________________________

_________________________________________________

Interactions between organisms include these:

_________________________________________________

Interactions between organisms and the environment include these:

_________________________________________________

_________________________________________________

Sketch of My Ecosystem
Ecosystems  Chapter Wrap-Up

Think about the terms and descriptions below. Write the term that most closely matches the description on the line in front of the description. Compare your previous responses with these.

<table>
<thead>
<tr>
<th>biome</th>
<th>ecosystem</th>
<th>estuary</th>
<th>intertidal zone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>community of living organisms interacting with each other and their physical environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>part of the shoreline that is under water at high tide and exposed to the air at low tide</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a large geographic area with an interactive environmental community and similar climate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>extremely fertile area where a river meets an ocean; contains a mixture of freshwater and saltwater and serves as a nursery for many species</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 things that you have learned about ecosystems.

__________________________  
__________________________  
__________________________  
__________________________  
__________________________  
__________________________
Conserving Resources

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>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.

Science Journal

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. 

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

*geyser* 

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

- *natural resource*

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

*modify* 

---

Copyright © Glencoe/McGraw-Hill, a division of The McGraw-Hill Companies, Inc.
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.

Conserving Resources

Fossil Fuels

I found this information on page ____________.

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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.

Acid Rain

Effects

Prevention

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

Greenhouse Effect

Ozone Depletion

Fossil fuels are burned.

CFCs are used in cooling systems.
Main Idea

Indoor Air Pollution

I found this information on page _________.

Water Pollution

I found this information on page _________.

Soil Loss and Soil Pollution

I found this information on page _________.

Details

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: ____________________________

__________________________

__________________________

__________________________

__________________________
Section 3 The Three Rs of Conservation (continued)

Main Idea

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

Reduce

I found this information on page ____________.

Reuse

I found this information on page ____________.

Details

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

Definition: __________________________________________

Examples: __________________________________________

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

1. __________________________________________
2. __________________________________________
3. __________________________________________
4. __________________________________________
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.
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>
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<td>• Sun, wind, and heat within Earth’s crust can be used to generate power.</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 new ways you could practice conservation.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

298 Conserving Resources
adapt: to change to fit new conditions
affect: to make something happen; to have an effect on
annual: plant that completes its life cycle in one year
apparent: readily seen, visible, readily understood or perceived; evident; obvious
area: amount or extent of a surface
attach: to be connected
benefit: to help
capable: able to do things; fit
chemical: made by chemistry
chemical bond: the force holding atoms together in a molecule
code: (noun) set of signals representing letters or numerals, used to send messages; (verb) to put in the form or symbols of a code
complex: composed of two or more parts; complicated
compound: (adjective) made of two or more separate parts or elements
constant: not changing; staying the same
contact: act or state of touching or meeting
convert: to change from one form or function to another
coordinate: to cause to work well together
cycle: a complete set of events or phenomena recurring in the same sequence
decay: to weaken or lessen
definite: having exact limits in size, shape, or number of parts
detect: to catch or discover; to manage to perceive
distribute: to divide among several or many
dominate: to control or rule
energy: capacity to perform some type of work or activity
environment: living and nonliving factors that surround an organism
estimate: (noun) an opinion of the value, quality, size, or cost of something; (verb) to form an opinion by reasoning
external: on, or for use on, the outside of the body
facilitate: to make easy or easier
flexible: able to bend or flex
function: (noun) a specific job or purpose; (verb) to carry out a specific action
fundamental: serving as an original or generating source; primary
generate: to originate or bring into existence
hypothesis: something that is suggested as being true for the purposes of argument or of further investigation
identical: same
individual: separate
insert: to put or fit (something) into something else
interact: to act on one another

intermediate: in the middle or being between

internal: of or on the inside

interpret: to tell the meaning of; to understand

involve: to include; to have as part of itself

layer: one thickness of something

mature: to become fully developed or ripe

method: way of doing something; a process

migrate: to move from one place to another place

model: a description used to help visualize something that cannot be directly observed

modify: to undergo change

network: a group of related parts

obtain: to get possession of, especially by some effort

occur: to take place; to be found

participate: to take part; share

physical: having to do with the body

process: series of steps performed in doing something

promote: to contribute to the growth of; to help bring into being

react: to act because something has happened; respond

reject: to refuse to accept or use

relax: to become inactive and lengthen

release: to set free; to let go

remove: to get rid of

require: to be in need of

resource: something used for help or support

respond: to react in response

series: a number of similar things coming one after another

similar: almost, but not exactly the same

soil: mixture of weathered rock, organic matter, water, and air that supports the growth of plant life

source: any person, place, or thing by which something is supplied

specific: exact; particular

stable: firmly established; not changing or fluctuating

structure: arrangement of parts or the way parts are arranged

survive: to continue living

transfer: to convey or transport from one place to another

transport: to carry from one place to another; the act, process, or means of transporting

visible: able to be seen

widespread: widely scattered or prevalent