Reading and Writing in Science
# LIFE SCIENCE

## CHAPTER 1
### Adaptations in Land Environments

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter Concept Map</td>
<td>1</td>
</tr>
<tr>
<td>Chapter Literature: Poem (“Giant Sequoias”)</td>
<td>2</td>
</tr>
<tr>
<td>Lesson 1</td>
<td>3</td>
</tr>
<tr>
<td>Lesson Outline</td>
<td>3</td>
</tr>
<tr>
<td>Lesson Vocabulary</td>
<td>5</td>
</tr>
<tr>
<td>Cloze Test</td>
<td>6</td>
</tr>
<tr>
<td>Lesson 2</td>
<td>7</td>
</tr>
<tr>
<td>Lesson Outline</td>
<td>7</td>
</tr>
<tr>
<td>Lesson Vocabulary</td>
<td>9</td>
</tr>
<tr>
<td>Cloze Test</td>
<td>10</td>
</tr>
<tr>
<td>Lesson 3</td>
<td>11</td>
</tr>
<tr>
<td>Lesson Outline</td>
<td>11</td>
</tr>
<tr>
<td>Lesson Vocabulary</td>
<td>13</td>
</tr>
<tr>
<td>Cloze Test</td>
<td>14</td>
</tr>
<tr>
<td>Reading in Science (Meet a Scientist Magazine)</td>
<td>15</td>
</tr>
<tr>
<td>Lesson 4</td>
<td>17</td>
</tr>
<tr>
<td>Lesson Outline</td>
<td>17</td>
</tr>
<tr>
<td>Lesson Vocabulary</td>
<td>19</td>
</tr>
<tr>
<td>Cloze Test</td>
<td>20</td>
</tr>
<tr>
<td>Lesson 5</td>
<td>21</td>
</tr>
<tr>
<td>Lesson Outline</td>
<td>21</td>
</tr>
<tr>
<td>Lesson Vocabulary</td>
<td>23</td>
</tr>
<tr>
<td>Cloze Test</td>
<td>24</td>
</tr>
<tr>
<td>Writing in Science (Describe Where You Live)</td>
<td>25</td>
</tr>
<tr>
<td>Chapter 1</td>
<td>27</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>27</td>
</tr>
<tr>
<td>Lesson 3</td>
<td>Lesson Outline .............................................. 59</td>
</tr>
<tr>
<td>Lesson Outline .............................................. 59</td>
<td></td>
</tr>
<tr>
<td>Lesson Vocabulary ........................................... 61</td>
<td></td>
</tr>
<tr>
<td>Cloze Test .................................................. 62</td>
<td></td>
</tr>
<tr>
<td>History of Science Magazine .............................. 63</td>
<td></td>
</tr>
<tr>
<td>Writing Science ............................................ 65</td>
<td></td>
</tr>
<tr>
<td>Chapter 3</td>
<td>Vocabulary .................................................. 67</td>
</tr>
<tr>
<td>EARTH SCIENCE</td>
<td></td>
</tr>
<tr>
<td>CHAPTER 4</td>
<td>Our Earth, Sun and Moon</td>
</tr>
<tr>
<td>Chapter Concept Map ........................................ 69</td>
<td></td>
</tr>
<tr>
<td>Chapter Literature: Poem (&quot;Sun and Moon&quot;) ................. 70</td>
<td></td>
</tr>
<tr>
<td>Lesson 1</td>
<td>Lesson Outline .............................................. 71</td>
</tr>
<tr>
<td>Lesson Outline .............................................. 71</td>
<td></td>
</tr>
<tr>
<td>Lesson Vocabulary ........................................... 73</td>
<td></td>
</tr>
<tr>
<td>Cloze Test .................................................. 74</td>
<td></td>
</tr>
<tr>
<td>Lesson 2</td>
<td>Lesson Outline .............................................. 75</td>
</tr>
<tr>
<td>Lesson Outline .............................................. 75</td>
<td></td>
</tr>
<tr>
<td>Lesson Vocabulary ........................................... 77</td>
<td></td>
</tr>
<tr>
<td>Cloze Test .................................................. 78</td>
<td></td>
</tr>
<tr>
<td>Writing in Science .......................................... 79</td>
<td></td>
</tr>
<tr>
<td>Lesson 3</td>
<td>Lesson Outline .............................................. 81</td>
</tr>
<tr>
<td>Lesson Outline .............................................. 81</td>
<td></td>
</tr>
<tr>
<td>Lesson Vocabulary ........................................... 83</td>
<td></td>
</tr>
<tr>
<td>Cloze Test .................................................. 84</td>
<td></td>
</tr>
<tr>
<td>History of Science Magazine .............................. 85</td>
<td></td>
</tr>
<tr>
<td>Chapter 4</td>
<td>Vocabulary .................................................. 87</td>
</tr>
<tr>
<td>Chapter 4</td>
<td>Vocabulary .................................................. 87</td>
</tr>
</tbody>
</table>
PHYSICAL SCIENCE

CHAPTER 6
Matter

Chapter Concept Map .................................................. 109
Chapter Literature: Poem (“Freezing Rain”) ...................... 110

Lesson 1  Lesson Outline ................................................. 111
Lesson Vocabulary ....................................................... 113
Cloze Test ................................................................. 114

Lesson 2  Lesson Outline ................................................. 115
Lesson Vocabulary ....................................................... 117
Cloze Test ................................................................. 118
Meet a Scientist Magazine ............................................. 119
Writing in Science ......................................................... 121

Lesson 3  Lesson Outline ................................................. 123
Lesson Vocabulary ....................................................... 125
Cloze Test ................................................................. 126

Chapter 6  Vocabulary .................................................... 127

CHAPTER 7
Energy

Chapter Concept Map .................................................. 129
Chapter Literature: Magazine Article (“Wind Power”) ......... 130

Lesson 1  Lesson Outline ................................................. 131
Lesson Vocabulary ....................................................... 133
Cloze Test ................................................................. 134
## Contents

| Lesson 2 | Lesson Outline .................................................. 135 |
| Lesson Vocabulary .................................................. 137 |
| Cloze Test ............................................................... 138 |
| History of Science Magazine ................................. 139 |
| Writing in Science .................................................... 141 |

| Lesson 3 | Lesson Outline .................................................. 143 |
| Lesson Vocabulary .................................................. 145 |
| Cloze Test ............................................................... 146 |

| Chapter 7 | Vocabulary ....................................................... 147 |

### CHAPTER 8

**Light**

| Chapter Concept Map .................................................. 149 |
| Chapter Literature: Poem (“Crystal Vision”) ...................... 150 |

| Lesson 1 | Lesson Outline .................................................. 151 |
| Lesson Vocabulary .................................................. 153 |
| Cloze Test ............................................................... 154 |

| Lesson 2 | Lesson Outline .................................................. 155 |
| Lesson Vocabulary .................................................. 157 |
| Cloze Test ............................................................... 158 |
| STS Magazine ........................................................... 159 |

| Lesson 3 | Lesson Outline .................................................. 161 |
| Lesson Vocabulary .................................................. 163 |
| Cloze Test ............................................................... 164 |
| Writing in Science .................................................... 165 |

| Chapter 8 | Vocabulary ....................................................... 167 |
Adaptations in Land Environments

The chart below divides land environments into biomes, biomes into the plants and animals that live in each, and the adaptations they have to survive in each biome. Try to fill in the blanks with more plants and animals and more of their adaptations.

**Desert**
- **Plant**: mesquite tree
  - thorns
  - long roots
  - small leaves
- **Animal**: coyote

**Grassland**
- **Animal**

**Forest**
- **Animal**: Poison Arrow frog
  - bright color
- **Plant**
  - grow low to the ground
  - grow in tight clumps

**Arctic Tundra**
- **Animal**
Giant Sequoias

Read the Literature feature in your textbook.

Write About It

Response to Literature  This poem tells us that sequoia trees can survive forest fires. What else have you learned about them from this poem? What conclusions can you make about their age and size? Write a paragraph about sequoia trees. Support your conclusions with what you already know about trees and details from the poem.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
Living Things and Their Needs

Use your textbook to help you fill in the blanks.

Where do living things live?

1. Living things live in an ______________ where they can meet their needs.

2. Plants and animals are ______________.

3. Water, air, and sunlight are ______________.

Biomes

4. Scientists group similar environments into ______________.

5. The ______________ of a biome affects which living things can survive there.

How do plants get what they need?

6. All plants need water, sunlight, ______________, and carbon dioxide.

7. ______________ carry food and water throughout a plant.

8. The leaves of a plant use energy from the Sun to change ______________ and water into food.

9. A plant’s roots take in ______________ and nutrients from soil.
How do animals get what they need?

10. Animals need water, energy from food, and ________________.

11. Animals cannot make their own ________________.

12. Legs, wings, and other body parts are examples of ________________.

13. Birds build nests as ________________ for their young.

14. A porcupine’s sharp quills keep it ________________ from other animals.

What helps living things survive in their environment?

15. ________________ help living things survive in their environments.

Summarize the Main Idea

16. What two things do both plants and animals need to survive?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Living Things and Their Needs

Match the correct letter with the description.

1. ____ A substance made up of broken-down plant and animal material.
2. ____ An area of land or water that has certain kinds of living and nonliving things.
3. ____ Everything that surrounds a living thing.
4. ____ A specific part of a living thing.
5. ____ A structure that helps living things survive in their environment.
6. ____ The typical weather conditions for a place over time.
7. ____ A substance that animals must breathe to stay alive.
8. ____ A plant part that carries food and water throughout a plant.
9. ____ A place in which animals can stay safe.
Fill in the blanks.

Where living things can meet their needs is their environment. You can also find water, air, and sunlight, which are ____________ things. An area of land or water, called a ____________ is made up of certain kinds of living and nonliving things. These areas have a ____________ , or typical weather conditions over time. Living things have special parts, or ____________ , so they can survive in their environment. Plants have leaves that take in carbon dioxide and ____________ that take in water from soil. Some animals, such as ____________, have gills to help them breathe. Animals have parts to keep them safe. A porcupine has sharp ____________ . Animals also build ____________ to keep them safe.
Life in the Desert

Use your textbook to help you fill in the blanks.

What is a desert?

1. A desert is a biome that has a _______________ climate.

2. It is hot during the _______________ and cold at _______________ in a desert.

3. Desert soil is mostly made up of _______________.

4. The sandy soil has very little _______________ to soak up rainwater.

What adaptations help desert plants?

5. Plants that grow in deserts have _______________ that help them survive with little water.

6. Mesquite trees have long roots that grow _______________ to find water.

7. The saguaro cactus has thick _______________ to help store water.

8. Spines on a prickly pear cactus _______________ it from thirsty animals.
What adaptations help animals?

9. Rattlesnakes are ____________________ ; they sleep during the day.

10. The jackrabbit has long ears to help it stay _______________ in the desert.

11. Some animals have _______________ to help them blend in with their environment.

Summarize the Main Idea

12. What adaptations help plants and animals survive in the desert?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Life in the Desert

Read each clue. Write the answer in the blanks and fill in the crossword puzzle.

Across

4. Many desert animals __________ during the day to avoid the heat.

5. The soil in the desert is mostly __________.

6. A desert animal with large ears that help it lose excess body heat is the __________.

Down

1. Because of their adaptations, desert plants can survive with little __________.

2. A special feature that helps an organism survive in a particular place is an __________.

3. A __________ is a hot, dry biome with very little rain.

adaptation
desert
jackrabbit
sand
water
sleep
A desert is a biome that has a dry climate. Less than 25 centimeters of ________ falls each year in the desert. During the day it is hot and the ________ warms land and air. At night the ________ drops and it is much cooler. Desert soil is mostly sand. There is very little ________ in desert soil. Rainwater trickles down through sand and goes very ________ .

In order for plants to survive in the desert, they must have ________ . So that they can reach the water that is deep underground, some plants have long ________ . Many desert plants also have thick stems and waxy leaves in order to store ________ .

Animals have adapted to deserts, too. Some animals are ________ and sleep during the day.
Life in the Grassland

Use your textbook to help you fill in the blanks.

What is a grassland?
   1. A biome that is covered with grass is a ____________________ .
   2. Some ____________________ eat grass as food.
   3. Grass can provide ____________________ from the cold and wind.
   4. Grasslands that are cold in the winter and warm in the summer are ____________________ grasslands.
   5. Grasslands that are warm all year are ____________________ grasslands.
   6. The Serengeti Plain in Africa is a ____________________ .

What adaptations help grassland plants survive?
   7. All grasses in grasslands grow well in ____________________ conditions.
   8. The grasses have deep roots that work like a ____________________ .
   9. If a grassland fire burns the grass above the soil, the ____________________ survive.
  10. The baobab loses its leaves during the ____________________ season.
What adaptations help animals survive in grasslands?

11. Grassland animals have ________________ that help them survive.

12. Some animals have special teeth for eating ________________.

13. Zebras eat the ________________ of grasses, and antelopes eat the ________________ closest to the ground.

14. Some animals dig ________________ in the ground to hide from enemies.

Summarize the Main Idea

15. How have the teeth of some animals adapted so they have something to eat in the grassland?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Chapter 1 • Adaptations in Land Environments
Use with Lesson 3
Reading and Writing in Science
Life in the Grassland
Life in the Grassland

Fill in the blanks.

1. The prairies of North America are __________________________ grasslands.

2. The __________________________ is a tropical grassland.

3. In a tropical __________________________, grasses may grow up to six feet tall.

4. Prairie dogs dig __________________________ in the ground to hide from enemies.

5. Gazelles and zebras travel in large __________________________.

Answer each question.

6. Why do fires form regularly in grasslands?

   __________________________________________________________________________

   __________________________________________________________________________

   __________________________________________________________________________

7. How do grasses survive after being eaten by plants?

   __________________________________________________________________________

   __________________________________________________________________________
Life in the Grassland

Grasslands are ________________ that are covered with grass. There are different kinds of grasslands. Temperate grasslands have four ________________ . Tropical grasslands have a ________________ that is warm all year round.

Because grasslands are dry, the roots of many grasses work like ________________ , soaking up water. They also store nutrients in their roots. When a fire burns the grasses above the ground, the roots below ________________ . The dead grass on top becomes part of the ________________ and a stalk grows from the ________________ .

Many animals eat grasses. Zebras have special ________________ that are ________________ . This allows them to bite off the ________________ of grasses.
Tinamous

Ana studies the birds of the Pampas. Some of the birds she studies are called tinamous. Their brown and gray feathers help them blend in with the tall grass and other shrubs and bushes. This camouflage helps them hide from predators like foxes and hawks that eat the birds or their eggs.

Compare and Contrast

- Look for similarities and differences
- Use your own experiences to apply to the situation

How does Ana find tinamous if they are so well hidden? She listens for their songs. Each species of tinamou has a different song. Sometimes she has to sing or play a recording of their song to get the birds to answer back. It takes time, patience, and a little luck.

The tinamous are hard to see, but their shiny green, turquoise, and purple eggs really stand out. Ana wants to know why the eggs are so colorful.

How do you think colorful eggs help the tinamous?
Write About It

Compare and Contrast  Ana Luz Porzecanski studies tinamous and their eggs. Work with a partner to compare and contrast the tinamou with its eggs. Then compare and contrast the tinamou with another animal you have read about in this chapter. List ways the animals are alike and different in a Venn diagram. Then use your diagram to write a compare and contrast essay.
Outline

Life in the Forest

Use your textbook to help you fill in the blanks.

What is a forest?
1. A forest is a biome with many ________________________________.
2. A tropical rain forest is found near the ________________________.
3. The climate of a tropical rain forest is ________________________
   and ________________________.
4. The soil in a tropical rain forest is not very rich in plant
   ________________________.
5. A temperate forest has four ________________________.
6. The soil in a temperate forest is rich in ________________________.

What adaptations help forest plants survive?
7. Plants are adapted to grow toward ________________________.
8. Many tall trees in a tropical rain forest have
   ________________________ roots.
9. Tall trees are supported by ________________________.
10. Smaller plants that grow under tall trees have
    ________________________ that allow them to lose extra water.
11. Plants on the forest floor have very large leaves to soak in
    ________________________.
How do animals survive in a tropical rain forest?
12. The bright colors of a poison arrow frog tell its enemies that it is ____________________.
13. When a living thing imitates another living thing it is called ____________________.

How do animals survive in a temperate forest?
14. Some animals eat extra food in the fall so they can store ____________________ for the winter.
15. Some animals ____________________ or go into a deep sleep that lasts all winter.

Summarize the Main Idea
16. How have some animals adapted so they can survive in the forest?

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________
## Life in the Forest

<table>
<thead>
<tr>
<th>Letter</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>buttresses</td>
</tr>
<tr>
<td>b.</td>
<td>camouflage</td>
</tr>
<tr>
<td>c.</td>
<td>conifer</td>
</tr>
<tr>
<td>d.</td>
<td>deciduous</td>
</tr>
<tr>
<td>e.</td>
<td>drip tips</td>
</tr>
<tr>
<td>f.</td>
<td>hibernate</td>
</tr>
<tr>
<td>g.</td>
<td>large leaves</td>
</tr>
<tr>
<td>h.</td>
<td>mimicry</td>
</tr>
</tbody>
</table>

Match the description with the correct letter for the adaptation.

1. _____ This allows an animal to blend in with its environment.
2. _____ These help a plant to soak up more sunlight.
3. _____ This type of tree has tough needles that help it to conserve water during the winter.
4. _____ These support a tall tree with shallow roots.
5. _____ This is when a mantis is able to look like an orchid flower.
6. _____ This is what squirrels do when they sleep all winter to store energy.
7. _____ This type of tree loses its leaves in the fall so it can conserve energy in the winter.
8. _____ These help leaves to lose extra rainwater.
A biome that has many trees is a forest. Tropical rain forests are found near the equator. The temperature in a tropical rain forest is usually hot all year. It also gets about 200 to 460 centimeters of rain each year. Temperate forests have four seasons and rainfall and temperature change from season to season.

In the tropical rain forest, there are many tall trees that block a lot of the sunlight down below. Plants on the forest floor have leaves in order to get as much sunlight as they can. Many of these plants have large leaves to get more sunlight.
Life in the Arctic Tundra

Use your textbook to help you fill in the blanks.

What is an Arctic tundra?
1. The arctic tundra is a ____________ biome.
2. The arctic tundra is located above the ____________.
3. In the middle of ____________ the Sun never rises.
4. During ____________ the Sun never sets.
5. A layer of frozen soil called ____________ prevents melted snow from soaking into the ground.

What adaptations help arctic plants?
6. All plants living in the Arctic tundra have ____________ or ____________ roots.
7. Having these types of roots allow plants to survive in soil that is mostly ____________.
8. Most Arctic plants grow ____________ the ground.
9. Many plants grow in tight clumps to ____________ them from the cold and wind.
10. Plants that have dark colors can absorb ____________ more easily.
What adaptations help Arctic animals?
11. Polar bears and musk oxen have a layer of ____________ or fat.
12. Arctic animals usually have ________________ bodies and ________________ fur than their relatives in other biomes.
13. Many Arctic animals have wide feet that keep them from ________________.
14. Long, sharp ________________ keep Arctic animals from slipping and sliding on ice.
15. Canada geese and caribou ________________ when seasons change.
16. Arctic animals that eat plants ________________ where they can find food more easily.
17. The fur of the Arctic fox changes color from ________________ so it can blend in with its environment year round.

Summarize the Main Idea
18. Explain how Arctic plants and animals have adaptations to help them survive in the arctic tundra.

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
Life in the Arctic Tundra

Fill in the blanks.

1. The cold biome of the far north is called the ____________________

2. Animals that move south to warmer environments in winter ____________________

3. When animals go into a very deep sleep in the winter that helps them conserve energy, they ____________________

4. By growing in tight clumps and close to the ground, the plants are protected from wind and freezing ____________________

5. In the summer the ground becomes ____________________ because a layer of ____________________ prevents melted snow from soaking into the ground.
Fill in the blanks.

The arctic tundra is located above the Arctic Circle. It is a

____________________ biome. Winters are long and dark. The Arctic

tundra has about six to ten weeks of ______________________.

When temperatures get warm enough, snow ______________________.

Puddles form on the land because the ______________________ layer

prevents water from soaking into the ground.

About 17,000 different kinds of plants live in the Arctic tundra.

Many have shallow or no ______________________. Plants often grow in
tight ______________________. This protects them from the wind and
cold temperatures.

Arctic animals have also adapted to the climate. Some animals

____________________ to warmer places during the Arctic winter.

Other animals have thick fur or a layer of ______________________.

This keeps them warm when the temperatures are freezing.
Life in the Arctic Tundra

Read the Writing in Science feature in your textbook.

Write About It

Choose two animals that live in the tundra. Write a paragraph in which you compare and contrast them. Use words such as like and unlike to show how they are similar, yet different.

Getting Ideas

Choose two arctic animals. Write their names above the circles. Write details that show how they are different in the outer part of the circles. Write details that show how they are the same in the part that overlaps.

Animal ___________________ Animal ___________________
Drafting

Now write the first draft of your paragraph. Begin with a topic sentence. Write sentences that compare and contrast the two animals. Use details that create a vivid picture.

Now revise and proofread your paragraph. Ask yourself:

- Did I begin with a topic sentence?
- Did I use details that help my readers picture the animals?
- Did I show how the animals are alike and different?
- Did I use words that compare and contrast, such as like and unlike?
- Did I correct all grammar errors?
- Did I correct all spelling, punctuation, and capitalization errors?
Land Environments

Choose the letter of the best answer.

1. What is another name for the temperate grassland of North America?
   a. arctic tundra  
   b. prairie  
   c. savanna  
   d. temperate forest

2. An area with certain kinds of living and nonliving things is a(n)
   a. animal.  
   b. biome.  
   c. climate.  
   d. environment.

3. Permafrost is a layer of
   a. frozen soil.  
   b. snow.  
   c. frost on trees.  
   d. ice on the ocean.

4. Broken down plant and animal matter is
   a. environment.  
   b. humus.  
   c. structure.  
   d. sand.

5. Savanna is found in Africa, and is another name for
   a. deciduous forest.  
   b. desert.  
   c. tropical grassland.  
   d. tropical rain forest.

6. A nocturnal animal is an animal that is active during
   a. day.  
   b. night.  
   c. summer.  
   d. winter.
Choose the letter of the best answer.

7. A mixture of broken down rocks, plant, and animal material is also called
   a. carbon dioxide.  
   b. environment.  
   c. forest.  
   d. soil.

8. If most of the trees in a forest lose their leaves during the winter, it is a(n)
   a. arctic tundra.  
   b. coniferous forest.  
   c. deciduous forest.  
   d. rain forest.

9. What does the word mimicry describe?
   a. a poisonous species  
   b. a species with an adaptation  
   c. one species eats another species  
   d. one species looks like another species  

10. An animal that hibernates is adapted to
    a. deserts.  
    b. cold winters.  
    c. tropical rain forest.  
    d. mimicry.

11. In which biome do you find the greatest numbers of plants and animals?
    a. coniferous forest  
    b. savanna  
    c. temperate forest  
    d. tropical rain forest

12. Arctic tundra is a biome
    a. near the equator.  
    b. above the Arctic Circle.  
    c. with trees.  
    d. without living things.
Water Environments

Complete the concept map with the information you learned about adaptations of living things in oceans and wetlands. Some answers have been written for you.

**Examples**

<table>
<thead>
<tr>
<th>Ocean</th>
<th>Wetland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant</td>
<td>Plant</td>
</tr>
<tr>
<td>Plant</td>
<td>Plant</td>
</tr>
<tr>
<td>Animal</td>
<td>Plant</td>
</tr>
<tr>
<td>Animal</td>
<td>Animal</td>
</tr>
<tr>
<td>Plant</td>
<td>Animal</td>
</tr>
</tbody>
</table>

**Adaptations**

- clump together
- grow to huge sizes
- leaf like structures

- lighted “fishing pole” to attract prey

- large roots grow above water
- floating seeds with sharp ends

- stand still to hunt prey
- long neck
Dragons of the Sea

Read the Literature feature in your textbook.

Write About It

Response to Literature  Looking like seaweed keeps leafy sea dragons safe in their environment. Why is safety important? Do special structures help keep you safe? Write a paragraph about ways you keep safe.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
The Water Planet

Use your textbook to help you fill in the blanks.

What is a water environment?
1. Earth is divided into land and ______________________ environments that are filled with different types of living things.
2. Earth’s water environments are oceans, lakes, ponds, rivers, streams, and ______________________.
3. Earth’s water environments are divided into two groups called ______________________ and freshwater environments.
4. A saltwater environment that is filled with plants and animals is called a ______________________.
5. A ______________________ such as a river, pond, or lake has water with almost no salt.
6. A mixture of fresh and salt water, which occurs where rivers meet the ocean, is called a ______________________ environment.

How are water environments different from each other?
7. Besides the amount of salt, water environments vary in ______________________.
8. Some water environments such as ______________________ can be thousands of feet deep.
9. Plants cannot grow in deep water because the ______________________ doesn’t reach them.
10. Water ______________________ varies with depth and nearness to the equator.
11. Water temperatures near the ________________ are warmer.

12. Plants and animals ________________ to the type of water environment they live in.

**What plants and animals live in water environments?**

13. Most plants and animals live near the ________________ since deep water is cold and dark.

14. Water lilies live in fresh, shallow waters. The air spaces in their leaves help them ________________.

15. ________________ fish live in the warm salt water of oceans near the equator.

**Summarize the Main Idea**

16. How do saltwater environments differ from freshwater environments?
Match the vocabulary word with its correct description. Each vocabulary word will be used twice.

- a. depth
- b. marine environment
- c. saltwater environment
- d. freshwater environment

I have water with almost no salt.
I have water that is very salty.
I am another name for a saltwater environment.
I describe how deep something is.
I am an ocean.
I am a lake, pond, river, or stream.
I affect the temperature of water.
I am a body of water with algae and fish.
The Water Planet

Fill in the blanks.

Three quarters of Earth is covered by water. Earth has _________________ types of water environments. _________________ environments have salty water. A _________________ is also salty. An _________________ is an example of a marine environment. A lake is an example of a _________________ environment because it has very little salt.

Water that is a mixture of both salt and fresh water is called _________________ . The water depth, amount of sunlight, and _________________ are differences in water environments. For instance, shallow water that gets a lot of sunlight is _________________ than deep, dark water. _________________ and animals must adapt to life in fresh water or salt water. Only a few plants and animals can live in _________________ water because it is dark and cold.
Life in an Ocean

Use your textbook to help you fill in the blanks.

What is an ocean like?

1. The ocean is home to ________________ of living things.
2. Most ocean life forms live in ________________ water.

How do plants survive in the ocean?

3. Some plants attach ________________ while others drift with water.
4. Plants with roots usually live in shallow water because the plants need ________________.
5. ________________ such as kelp is one of the types of algae.
6. Algae give off ________________ when they make food.
7. Algae that grow very large and clump together are ________________.
8. To catch sunlight, kelp uses ________________, and its roots attach to the ocean floor.
9. Kelp also has balloon-like balls that keep its vines ________________.
10. ________________ of animals live and feed on kelp.

How do animals survive under water?

11. Animals that live under water ________________ and move differently than land animals.
12. Fish use _________________ to breathe underwater.
13. Some animals use _________________ to hide and stay safe in the ocean.

Staying Safe
14. The sting ray has a sharp and _________________ tail.
15. _________________ is another way animals stay safe under water.

How do creatures survive in the very deep ocean?
16. The angler fish and the _________________ are examples of sea creatures who have adapted to a deep-sea environment.

Summarize the Main Idea
17. How do plants and animals adapt to life in the ocean?
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
Life In An Ocean

Use the clues to fill in the crossword puzzle.

**Down**
1. Special structures that enable plants and animals to survive ____________
2. The largest ____________ is an ocean.
3. A sea creature that moves by squirting water ____________

**Across**
4. Hundreds of ocean animals live and feed in forests of ____________.
5. Plants attach themselves to the ocean floor with ____________.
6. Some animals use ____________ to stay safe.
The world’s largest biome is the ocean. Billions of living things are found in Earth's _________________. Since the bottom of the ocean is dark and cold, most ocean life lives in ________________, water. Plants adapt to ocean life by attaching ________________ to the ocean floor or drifting with the water. ________________ are plants living in the ocean. In shallow, warm waters, algae grow large and create _________________. Kelp have adapted to living in water by using leaf-like structures to catch sunlight and balloon-like balls to keep their vines _________________. Animals have to ________________ to live in the ocean, too. They have special parts to enable them to eat, stay safe, move, and ________________ underwater. For example, fish have ________________ that help them breathe underwater. Fish also have fins and tails to help them ________________ through the water.
Life in the Wetlands

Use your textbook to help you fill in the blanks.

What are wetlands?

1. ____________________ are areas where water covers the land much of the year.

2. There are coastal and ____________________ wetlands.

3. Wetlands vary based on the ____________________ living in it.

4. Marshes, swamps, and ____________________ are types of wetlands.

5. Wetlands help prevent ____________________ by holding extra water.

6. In ____________________, wetlands become a source of water because they hold extra water.

What kinds of plants live in wetlands?

7. Wetland plants create special ways to get ____________________.

8. Some plants such as ____________________ have a special pumping system to get oxygen to their roots.

9. Swamp trees such as ____________________ have woody roots that grow above the water and absorb oxygen from the air.

What kinds of animals live in a wetland habitat?

10. Animals need the wetlands for food, water, and ____________________.

11. Some birds would become ____________________ without the wetlands.
12. Many ________________ live in the wetlands.

13. Walking catfish, herons, and ________________ are types of animals that live in the wetlands.

14. These animals have ________________ to life in a very wet environment.

Summarize the Main Idea
15. How have wetland plants and animals adapted to the unique wetland environment?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Life in the Wetlands

Match the correct letter with its description.

1. _____ A wetland with soft-stemmed plants such as reeds and grasses
2. _____ An area of very wet land
3. _____ A long period with little or no rainfall
4. _____ A freshwater wetland filled with spongy moss and rich soil
5. _____ A species that no longer exists
6. _____ A wetland with woody plants such as cypress trees and royal palms
7. _____ An animal that can live on both land and water
8. _____ Rich soil found in bogs
Fill in the blanks.

Wetlands are areas of very wet land. Wetlands are found on every continent except ______________ . Wetlands help prevent ______________ by holding extra water. They also store extra water during ______________ . Marshes, ______________ , and bogs are types of wetlands. A ______________ is mostly reeds and grasses. Swamps have ______________ plants such as trees and palms. A bog is a ______________ wetland filled with moss and peat. Each wetland contains different types of ______________ . Plants living in wetlands have special ways of getting oxygen and ______________ . Animals have also ______________ to life in the wetlands. These adaptations allow plants and animals to survive in a very wet environment.
Mail Call

Scientists at the American Museum of Natural History work to protect endangered habitats around the world. They collect stories from people around the world to learn about these environments.

TO: American Museum of Natural History  
FROM: Tommy  
SUBJECT: Save the Mangroves!

Dear Museum Scientists,

My name is Tommy and I’m writing to you because I’m worried about what’s happening near my home.

I live on the coast of Florida, near a mangrove forest. It’s full of beautiful, tropical evergreen trees that have roots and branches all tangled together. The mangroves are home to many animals, including manatees, storks, butterflies, snakes, and tree crabs. Mangrove roots provide shelter for fish and shrimp. The mangroves also protect the coast from wind, waves, and floods. My mom is a tour guide who shows people the amazing creatures that live in the mangroves.

Lately many new neighborhoods are being built, and this construction has replaced many mangroves with stores and homes, marinas, airports, and parking lots.

What will happen to the animals that call the mangroves home? I know there’s a way for us and the mangroves and animals to live together.

Tommy
Wetland Plants

Write About It

Predict What do you think will happen to the wetland plants and animals near Tommy’s home if people continue to fill in wetlands and build new neighborhoods?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Write a letter back to Tommy explaining why it is important to save wetlands. Tell ways you think we can help protect wetlands.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
A Wetlands Story

Write About It

Write a story that takes place in the wetlands. First decide on your characters. What happens because they live in the wetlands? What problem do they have? How do they solve it? Make sure your story has a beginning, middle, and an end. Include details to develop the action, or plot. Add dialogue to bring your characters to life.

Write a sentence describing the setting to begin your story.

________________________________________________________________________

Now write your story. Start by describing the setting. Then introduce the characters and show their problem. Tell the events in order. Show how the problem is solved at the end.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Revising and Proofreading

Here are some sentences from another student’s story. Proofread it. Add quotation marks where they are needed.

Look at the egrets in that willow tree! shouted Ray. There’s a heron standing in the water, and it looks like it’s fishing.

Shh! Be quiet, whispered Jesse. I want to get close so that I can get a picture. He started to hunt in his backpack for his camera.

Now revise and proofread your story. Ask yourself:

• Did I begin by describing the setting?
• Did I use details to create a vivid picture of the wetlands?
• Did I create a problem that fits this setting?
• Did I create interesting characters?
• Did I tell events in order?
• Did I show how the problem is solved?
• Did I correct all grammar errors?
• Did I correct all spelling, punctuation, and capitalization errors?
Water Environments

Choose the letter of the best answer.

1. A freshwater environment
   a. never freezes.  
   b. has flowing water.
   c. has very little salt.  
   d. is shallow.

2. A wetland that contains large amounts of moss and peat is a
   a. bog.  
   b. marsh.  
   c. swamp.  
   d. mangrove.

3. A plant-like organism that lives in water and makes its own food from sunlight is
   a. algae.  
   b. coral.  
   c. eel grass.  
   d. sea urchins.

4. A wetland with mostly soft-stemmed plants is called a
   a. mangrove.  
   b. marsh.  
   c. pond.  
   d. swamp.

5. A special structure used by underwater organisms to breathe is a
   a. fin.  
   b. gill.  
   c. shell.  
   d. tail.
Choose the letter of the best answer.

6. An animal that can live both in and out of water is a(n)
   a. amphibian.               c. mammal.
   b. bird.                    d. reptile.

7. A body of water with very salty water is a
   a. freshwater environment.  c. saltwater environment.
   b. lake environment.        d. swampy environment.

8. The distance from the surface to the bottom of a body of
   water is its
   a. area.                    c. height.
   b. depth.                   d. volume.

9. A wetland with woody plants in it is called a
   a. bog.                     c. pond.
   b. marsh.                   d. swamp.

10. A marine environment is a
    a. deep water environment.  c. saltwater environment.
    b. freshwater environment. d. swamp water environment.
Environments Change

Write some causes of change and the effects they have on the environment. An example has been done for you.

### Causes
- beavers building dams

### Effects
- land floods
- new wetland is created
- plants and animals die
- new area for plants and animals to live

<table>
<thead>
<tr>
<th>Causes</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>beavers building dams</td>
<td>land floods plants and animals die</td>
</tr>
<tr>
<td></td>
<td>new wetland is created new area for plants and animals to live</td>
</tr>
</tbody>
</table>
Can We Save the Peregrine Falcon?

Read the Literature feature in your textbook

**Write About It**

Response to Literature  This book tells us that peregrine falcons almost died out. What is the author trying to tell us about environmental changes? Write a paragraph about environmental changes. Include what we can do to protect the environment.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Living Things Change Their Environment

Use your textbook to help you fill in the blanks.

How do living things change their environment?

1. All living things affect the ____________________.
2. Living things must ____________________ for food, water, and other things they need to survive.
3. An example of competition is when ____________________ grow in ways to receive the most sunlight.

How does a beaver change its environment?

4. Beavers build dams for better access to food and for ____________________.
5. Dams can be ____________________ to the environment when they create new wetlands.
6. ____________________ attract other animals including fish and birds.
7. Dams can ____________________ the environment when they cause flooding.

How do people change their environment?

8. Of all living things, ____________________ have the greatest effect on the environment.
9. The process of burning oil, coal, and gas produces small particles that ____________________ our air and water.
10. One way to reduce the amount of trash we produce is to _______________ items such as paper and plastic.

11. Another way to reduce our trash is to use fewer materials or to _______________.

**What happens to our trash?**

12. In the United States, ________________ of our trash is reused in some way.

13. Over half of the trash in the United States is put into ________________.

14. 14% of the trash in the United States is ________________.

**Summarize the Main Idea**

15. How do living things affect the environment? Give examples.

__________________________

__________________________

__________________________

__________________________
Day and Night

Vocabulary

a. competition  
b. conserve  
c. dam  
d. landfill  
e. pollution  
f. recycle  
g. resources

Match the correct letter with the description.

1. _____ An area where trash collected from people's homes is taken
2. _____ A structure that blocks the flow of water
3. _____ Items living things need to survive including water
4. _____ When animals struggle for the same resources
5. _____ When people use as little of an item as possible
6. _____ When unwanted substances are found in water, air, or land
7. _____ To use an item more than once
Fill in the blanks.

All living things affect the environment in some way. When trees drop their leaves, worms and other living things break down those leaves, making the soil richer. This change is ____________ for the environment. When humans burn resources to make energy, they ____________ the environment, and this is a harmful change to the environment. When living things compete for ____________, such as water and sunlight, they change the environment as well. People can ____________ the amount of harm they bring to the environment by conserving resources such as oil and coal. People can also ____________ items such as plastic and metal cans. Today, the United States only reuses 30% of our ____________. Over half of our trash winds up in ____________. By reusing and recycling, we can ____________ the amount of trash so that less land will be used for landfills and less pollution will be produced.
Changes Affect Living Things

Use your textbook to help you fill in the blanks.

What are some ways environments change?

1. Heavy rains and other forms of ___________________ can change the environment.

2. Some changes, such as earthquakes and volcanic eruptions, can affect the environment for ___________________.

3. ___________________ also cause changes to the environment through actions such as logging and pollution.

How do changes affect plants and animals?

4. Living things have ___________________ that enable them to survive in their environment.

5. When the environment changes, some living things are able to adapt, while others must ___________________ to a new location.

6. If an animal is not able to adapt to changes in the environment or move, it may ___________________.

7. Some animals adapt by changing their ___________________.

How do living things depend on each other?

8. An ecosystem is made up of all the ___________________ and nonliving things in an area.

9. A ___________________ is made up of one type of living thing, for instance, all the roses in a garden.
What happens when new living things move in?

10. A new living thing introduced into an ecosystem may _____________ for resources in the area.

11. A new living thing can upset the ________________ among the living things in an ecosystem.

12. Introducing new living things to an ecosystem can result in other members of the community ________________.

13. In California, ________________, planted to prevent erosion, are causing the decline of native trees.

Summarize the Main Idea

14. How do living things respond to changes in the environment?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
What Happens When Environments Change?

Match the correct letter with the description.

1. _____ A group of the same type of living things living in an area
2. _____ A long time without rain
3. _____ Everything that surrounds you
4. _____ The home of a living thing
5. _____ All the living things living in an area
6. _____ Special structures that help a living thing survive
7. _____ All the living and nonliving things in an area
What Happens When Environments Change?

Fill in the blanks.

There are many different reasons an environment can change. Some changes to an environment are ____________, for instance muddy land caused by rain. Other changes have more lasting affects on the ____________. These changes affect the ____________ that live there. Often, an ecosystem can recover from such changes. However, other changes, such as those caused by ____________, may take centuries to recover from. Many living things have ____________ that allow them to survive more usual changes in the environment, such as drought. If a living thing can not adapt, it must ____________ to a new location or it may die. When new living things are brought in to an environment, they often disturb the natural balance that exists. They may create more ____________ for resources.
Living Things of the Past

Use your textbook to help you fill in the blanks.

What happens if the environment suddenly changes?
1. When the climate of an environment changes, some living things may die out, and become ________________.
2. Some animals are able to survive changes in the environment by ________________ to it, others may move to another area.

How can we learn about things that lived long ago?
3. Fossils are the ________________ of plants and animals that lived long ago.
4. Scientists study ________________ to understand more about an animal’s diet, size, shape, and movement.
5. By looking at the fossils of an animal’s ________________ , scientists can tell what type of food the animal ate.
6. Fossils can also provide clues about the ________________ , for instance, if the animal lived near a body of water.
How are living things today similar to those that lived long ago?

7. Scientists studying __________________ have found that many plants and animals alive today look like those that were alive long ago.

8. After looking at the fossils of the __________________ , scientists concluded that they are related to the horseshoe crab.

Have some animals stayed the same over time?

9. Fossil crocodiles look __________________ to crocodiles alive today.

Summarize the Main Idea

10. What happens to those living things that can not survive in a changing environment? How can we study these living things?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Records from the Past

Match the correct letter with the description.

1. _____ An extinct animal similar to an elephant
2. _____ To change in order to survive in an environment
3. _____ Something that is very old
4. _____ An extinct marine animal that had a hard outer shell
5. _____ Something that no longer exists
6. _____ The average weather conditions for an area
7. _____ The remains of a living thing that lived long ago

a. adapt   d. extinct   g. trilobite
b. ancient  e. fossil
f. mammoth
Fill in the blanks.

Many different things can cause change in an environment. If the ________________ changes, for example, it becomes colder for a long period of time, the things that live in the area may be harmed. Some living things are able to move, others ________________ to the changes. Some animals can not survive, and they die out or become ________________ . ________________ also change the environment through activities such as farming and hunting. We are able to study animals that lived long ago using ________________ . Fossils also provide information about a plant or animal’s ________________ . Using fossils, scientists are able to learn about the structures of an ancient living thing, as well as where it lived, ________________ , and how it moved.
Looking at Dinosaurs

Read the Reading in Science feature in your textbook.

Scientists compare the structures of living animals with fossils and remains from the past. Dinosaurs were once the dominant land animals. New evidence is helping scientists find out how dinosaurs lived and why they might have disappeared. Take a look at how our views of dinosaurs have changed based on new evidence.

1842  Dinosaurs Are Named

British scientist Richard Owen names the group of large, extinct reptiles “dinosauria,” from Greek words meaning “fearfully great lizard.” Before that, people thought these strange bones came from dragons or giants!

1923  Dinosaur Nests Are Found

American scientists Roy Chapman Andrews and Walter Granger find dinosaur nests in the Gobi desert in China. The nests prove that dinosaurs laid eggs and did not give birth to live babies.

1995  Dinosaurs Don’t Drag Their Tails

The T. rex skeleton at the American Museum of Natural History is changed to show the predator standing on two feet with its head low and tail off the ground. This is based on studies of fossils, dinosaur tracks, and how different animals move.

2000  Dinosaurs Have Feathers

A team of Chinese and American scientists finds a 130-million-year-old fossil dinosaur covered from head to tail with primitive feathers. Now most scientists agree that birds are living dinosaurs!
Cause and Effect

• The cause tells why something happened.
• The effect is what happened because of the cause.
• Clue words such as because, if, then, and in order describe a cause and effect relationship.

Write About It

Cause and Effect What caused scientists to change some of their ideas about dinosaurs? For each sentence, describe how scientists have changed their ideas and, using “because,” list the new evidence that supports their new ideas.

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________

____________________________________________________________________________________
Fossil Footprints

Read the Writing in Science feature in your textbook.

Write About It

Write a paragraph. Tell what scientists can learn from looking at footprints of animals that lived long ago. Include facts and details. Use words such as because and so to go from one idea to the next. At the end of your paragraph, tell what conclusions scientists can draw from looking at fossil footprints.

Getting Ideas

Do some print and online research. Find facts and details about fossil footprints.

Planning and Organizing

Here is some information that Chua found. Write Yes if it backs up the idea that scientists can learn a lot from fossil footprints. Write No if it does not.

1. Footprints show how many toes the animal had. _____
2. Scientists can tell from the footprints whether it walked on four legs or two legs. _____
3. I saw some interesting fossils at the Natural History Museum. _____
Drafting

A good topic sentence tells the main idea of the paragraph. Write your own topic sentence.


Now write your paragraph on a separate piece of paper. Begin with your topic sentence. Include facts and details that back up your main idea. End with a conclusion about learning from fossil footprints.

Revising and Proofreading

Here are some sentences that Chua wrote. Use the word because to combine each pair.

1. Scientists know that dinosaurs roamed North America. They found dinosaur footprints there.

2. There are many more fossil footprints than skeletons. Each animal made many tracks.

Now revise and proofread your paragraph. Ask yourself:

• Did I begin with a topic sentence that states my main idea about fossil footprints?
• Did I include supporting facts and details?
Environments Change

Choose the letter of the best answer.

1. All the living things in an ecosystem are called a(n)
   a. community.  c. habitat.
   b. environment.  d. population.

2. Sending glass bottles to be melted and turned into new bottles is a way to
   a. compete.  c. recycle.
   b. conserve.  d. pollute.

3. All the living and nonliving things in an area are a(n)
   a. community.  c. habitat.
   b. ecosystem.  d. population.

4. All the individuals of one kind of living thing in an area are a(n)
   a. community.  c. environment.
   b. ecosystem.  d. population.

5. The preserved remains of a plant or animal is a
   a. community.  c. habitat.
   b. fossil.  d. population.

6. If there are no more of a living thing alive on Earth, it is
   a. adapted.  c. extinct.
   b. conserved.  d. preserved.
Choose the letter of the best answer.

7. Dangerous chemicals or materials in the environment cause
   a. flooding.  
   b. conservation.  
   c. competition.  
   d. pollution.

8. To use less of a resource is a way to
   a. compete.  
   b. conserve.  
   c. recycle.  
   d. pollute.

9. What word describes the living and nonliving surroundings of a living thing?
   a. adaptation  
   b. climate  
   c. environment  
   d. structure

10. What happens when two living things require the same resources?
    a. competition  
    b. conservation  
    c. pollution  
    d. protection
Our Earth, Sun, and Moon

Complete the concept map about the movement of the Earth and Moon. Some examples have been done for you.

**Earth**
- Rotation causes day and night

**Moon**
- 4-week lunar cycle
The Sun and the Moon

Read the Literature feature in your textbook.

Write About It

Response to Literature The poet uses rhyme, rhythm, and vivid words to tell how she feels about the Sun and Moon. Write a poem about the Sun and Moon. Show how they are different. Use words that create a strong impression and show how you feel.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Day and Night

Use your textbook to help you fill in the blanks.

How does the Sun's position in the sky seem to change?
1. The ___________________________ is highest in the sky at the middle of the day.
2. The Sun is ___________________________ in the sky in the evening.
3. The Sun ___________________________ in the east.
4. The Sun ___________________________ in the west.
5. Shadows change as ___________________________ changes.
6. Shadows are shortest at ___________________________.
7. In the evening, shadows are longer because the ___________________________ is smaller than at midday.

What causes night and day?
8. Earth is always ___________________________, or spinning.
9. Daylight occurs in those areas of the Earth that are ___________________________.
10. When an area of Earth faces away from the Sun, it is ___________________________ there.
11. The Sun rises in the east because Earth rotates from ___________________________.
12. It takes Earth ___________________________ hours to complete one rotation.
**What is an axis?**

13. Earth’s axis is an imaginary line ____________________ .

14. Earth spins around its ____________________ .

15. Earth’s axis is ____________________ , not straight.

16. The ____________________ is found at the south end of Earth’s axis.

17. The ____________________ is found at the north end of Earth’s axis.

**Summarize the Main Idea**

18. What causes day and night?

   ____________________________________________

   ____________________________________________

   ____________________________________________

   ____________________________________________

   ____________________________________________

   ____________________________________________
# Day and Night

<table>
<thead>
<tr>
<th>a. axis</th>
<th>d. North Pole</th>
</tr>
</thead>
<tbody>
<tr>
<td>b. day</td>
<td>e. rotate</td>
</tr>
<tr>
<td>c. east</td>
<td>f. shadow</td>
</tr>
<tr>
<td></td>
<td>g. west</td>
</tr>
</tbody>
</table>

Match the correct letter with the description.

1. _____ The time it takes Earth to completely rotate one time.
2. _____ The line around which Earth rotates.
3. _____ A dark area made when rays of light are blocked by a person or thing, and which changes when the angle of the Sun changes.
4. _____ This is where we see the Sun set.
5. _____ When things spin around their center, they do this.
6. _____ This is found at the north end of Earth’s axis.
7. _____ Earth rotates toward this direction.
Day and Night

<table>
<thead>
<tr>
<th>axis</th>
<th>goes down</th>
<th>overhead</th>
<th>shorter</th>
</tr>
</thead>
<tbody>
<tr>
<td>day and night</td>
<td>longer</td>
<td>rises</td>
<td>west</td>
</tr>
<tr>
<td>daytime</td>
<td>nighttime</td>
<td>rotates</td>
<td></td>
</tr>
</tbody>
</table>

Fill in the blanks.

Every day, we experience day and night. The Sun _____________ in the east, and sets in the ________________ . Early in the day, when the Sun is low in the sky, our shadows appear ________________ . As the day goes on and the angle of the Sun increases, our shadows become ________________ . At noon, the Sun is directly ________________ . As the afternoon becomes evening, our shadows become longer again as the Sun ________________ .

Earth ________________ in space. The imaginary line around which the Earth spins is called its ________________ . Earth’s rotation causes ________________ . When your town faces away from the sun, it is ________________ . When your town faces the sun, it is ________________ . It takes Earth twenty-four hours to rotate one time.
The Seasons

Why do seasons change?
1. Earth ______________________ around the Sun.
2. The path Earth travels around the Sun is called its __________________.
3. It takes Earth one year, about 365 days, to ____________________.
4. Because Earth’s axis is ____________________, part of the Earth will tilt toward the Sun, depending on where Earth is in its orbit.
5. The northern half of the Earth experiences summer when it is tilted ____________________.
6. When the northern half of Earth is tilted away from the Sun, it is ____________________ there.

How does the Sun’s path change from season to season?
7. In the spring, the Sun's path across the sky ____________________ as the days grow longer.

What are the seasons like in other places?
8. The imaginary line that separates the Northern and Southern Hemispheres is the ____________________.
9. Because the Sun strikes the equator at the same angle all year, the temperatures ____________________.
10. Areas ____________________________ do not have different seasons.

11. Areas farthest from the equator, at the poles, have
    ____________________________ weather for most of the year.

**Summarize the Main Idea**

12. What causes the seasons?

   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
The Seasons

| a. equator    | d. revolves          | g. winter  |
| b. Northern Hemisphere | e. Southern Hemisphere |          |
| c. orbit  | f. summer            |            |

Match the correct letter with the description.

1. _____ The top half of Earth
2. _____ The imaginary line that circles the middle of Earth
3. _____ During this time of year, the Earth is tilted away from the Sun
4. _____ The area of Earth below the equator
5. _____ The path Earth travels as it goes around the Sun
6. _____ What Earth does around the Sun
7. _____ The time of year when the Sun’s rays are the strongest
The Seasons

Fill in the blanks.

In most parts of the world, people experience all four seasons. The seasons are caused by Earth's tilt and because it revolves around the Sun. It takes Earth one year to orbit the Sun. As Earth travels around the Sun, it is tilted on its axis toward or away from the Sun. When your town is tilted away from the Sun, you experience winter. During this season, the temperatures are colder, and the days are shorter.

In the summer, your town is tilted toward the Sun. The Sun is higher in the sky and the temperatures are warm. Areas near the equator have higher weather all year, because they receive the same amount of sunlight throughout the year.
Seasons Where You Live

Read the Writing in Science feature in your textbook.

Write About It

Choose a season. Tell a true story about something you did during that season that you couldn’t do at another time of the year. Explain why you still remember the event. How did it make you feel? Include strong details that describe what the weather was like. Use time-order words to show the sequence of events. Remember to tell your story by using the I point of view.

Write five sentences you could use in your personal narrative. Put them in time order.

1. __________________________________________________________
2. __________________________________________________________
3. __________________________________________________________
4. __________________________________________________________
5. __________________________________________________________
Drafting

Try to grab your reader’s interest right away. Here are two sentences that Anthony wrote to begin his personal narrative. Circle the one he should use.

One winter day in the mountain, I learned that weather can be a mighty foe.
My parents and I went cross-country skiing one winter day.

Now write your personal narrative. Describe what the weather was like and tell the events in time order.

Revising and Proofreading

Now revise and proofread your personal narrative. Ask yourself:

• Did I use the I point of view?
• Did I tell the events in order and use time words?
The Moon

Use your textbook to help you fill in the blanks.

What are the phases of the Moon?
1. The different shapes of the Moon that we see are called ________________.
2. If the Moon appears to be getting ________________ over several days, it is said to be waxing.
3. If the Moon appears to be getting ________________ over several days, it is said to be a waning Moon.
4. The phase during which you cannot see the Moon is called the ________________.
5. When you are able to see the whole Moon, it is at the ________________ phase.
6. When only a small amount of the Moon can be seen, it is called a ________________.
7. When almost the entire Moon can be seen, it is called a ________________.

Why does the Moon seem to change shape?
8. ________________ of the Moon is always facing the Sun.
9. We see different phases of the Moon because of its ________________ around Earth.
10. The light we see coming from the Moon is a reflection of the ________________ light.
What is a lunar eclipse?

11. When Earth comes between the Sun and Moon, preventing sunlight from reaching the Moon, it is called a ________________.

12. During a lunar eclipse, the Moon is in ________________.

Summarize the Main Idea

13. Why does the Moon have different phases?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
The Moon

| a. Crescent Moon | d. lunar cycle | g. phases |
| b. Full Moon     | e. lunar eclipse | h. waning |
| c. Gibbous Moon  | f. New Moon     | i. waxing |

Match the correct letter with the description.

1. _____ This is when the entire side of the Moon is visible.
2. _____ This occurs when the Earth blocks sunlight from reaching the Moon.
3. _____ This is when the Moon appears to be getting smaller.
4. _____ These are the different shapes of the Moon we see on Earth.
5. _____ This is when the Moon looks thin and curved.
6. _____ This is when the Moon is more than half visible.
7. _____ The 29-day period in which the Moon goes through all of its phases.
8. _____ This is when the Moon appears to be getting bigger.
9. _____ This is when you cannot see any surface of the Moon.
Fill in the blanks.

As you look at the Moon over the course of several weeks, you will notice that the Moon appears to change its shape. The different shapes of the Moon are called its _________________. The period of time in which the Moon goes through all of its phases is called the _________________. In the first phase, you cannot see the lighted surface of the Moon; this is called the _________________. Within a few days, you can see a small piece of the Moon; this is called a _________________. As the Moon becomes more visible, it is said to be _________________. Halfway through the cycle, you see the ________________ phase. After this phase, the Moon wanes, or appears to be getting _________________. When more than ________________ of the moon is still visible, it is in the Gibbous Moon phase. Then, the Moon shrinks to a crescent, disappears, and the cycle begins again.
To the Moon!

Do you ever wonder about the Moon? How do we learn what the Moon is actually like? First, people used their eyes to observe the Moon. Then they developed tools such as telescopes. Then astronauts (and robots) went up to the Moon to study it up close.

- **1957** The Soviet Sputnik (“fellow traveler”) becomes the first artificial satellite to orbit Earth.

- **1959** Luna 1, 2, & 3 are the first spacecrafts to land on the Moon. They send pictures back to Earth. This is the first time anyone can see what the dark side of the Moon looks like.

- **1969** Apollo 11 mission is the first to land a man on the Moon. Neil Armstrong and Buzz Aldrin are the first astronauts to walk on the Moon and collect Moon samples.

- **1972** Apollo 17 is the last manned mission to the Moon. The crew spends 75 hours there. Astronauts Gene Cernan and Harrison Schmitt drive a Lunar Roving Vehicle around the surface of the Moon to collect samples.
A Sequence

- gives events in order
- tells what happens first, next, and last
- uses time-order words, such as early on and later, or first and last, to tell the order of events

Write About It

Sequence of Events Would you like to travel to the Moon? Write about an expedition to the Moon. Be sure your story tells what happens first, next, and last.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Our Earth, Sun, and Moon

Choose the letter of the best answer.

1. What occurs when Earth’s shadow falls on the Moon?
   a. lunar cycle           c. phase
   b. lunar eclipse         d. orbit

2. A real or imaginary line through the center of an object is a(n)
   a. axis.               c. equator.
   b. cycle.              d. phase.

3. The sequence of shapes the Moon goes through in a month is called a(n)
   a. lunar cycle.        c. orbit.
   b. lunar eclipse.      d. phase.

4. The path an object takes when revolving around another object is called a(n)
   a. axis.               c. eclipse.
   b. cycle.              d. orbit.
Choose the letter of the best answer.

5. An object moving around another object is said to
   a. axis.
   b. cycle.
   c. eclipse.
   d. revolve.

6. A phase of the Moon is its
   a. shape.
   b. cycle.
   c. equator.
   d. axis.

7. An object that turns around its axis is said to
   a. cycle.
   b. eclipse.
   c. orbit.
   d. rotate.

8. An imaginary line around the middle of Earth is a(n)
   a. axis.
   b. cycle.
   c. equator.
   d. phase.
A Closer Look at the Solar System

Complete the concept map about our solar system. Some examples have been done for you.
To Space and Back

Read the Literature feature in your textbook.

Write About It

Response to Literature Sally Ride tells about her experiences when the shuttle blasted off. How would such a trip make you feel? Write a fictional narrative about a trip in space. Create a character and tell what things this character sees and does in space.

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________
Our Solar System

Use your textbook to help you fill in the blanks.

What is the solar system?
1. The Sun and the objects that orbit around it are called the ________________.
2. A large ball that orbits the Sun is called a ________________.
3. Our solar system contains nine ________________ including Earth.
4. Many of these planets have one or more ________________ that orbit them.
5. Each planet ________________ around the Sun.
6. Some of the planets are smaller or larger than the planet ________________.

What are the planets like?
7. Four planets closest to the Sun are Mercury, Venus, Earth, and ________________.
8. These four planets are called ________________ planets.
9. These planets are warmer than the other planets because they are ________________.
What else is in our solar system?

10. Also part of our solar system are ________________, ________________, and ________________.

11. Thousands of asteroids are found in the asteroid belt between the ________________ planets.

12. Comets are mostly ________________ mixed with ________________.

13. Meteors are small pieces of broken-off ________________ or ________________.

14. Meteors are made up of ________________, ________________, or ________________.

15. Meteors usually burn up in ________________ atmosphere.

16. Earth’s atmosphere is a layer of ________________ that surrounds our ________________.

Summarize the Main Idea

17. What makes up our solar system?

____________________________________

____________________________________

____________________________________


Our Solar System

Match the correct letter with the description.

1. _____ It is a hot, glowing ball of gases.
2. _____ It is a large ball in space that orbits the Sun.
3. _____ It flies through the sky and hits Earth.
4. _____ It moves around the Sun in long, narrow orbits.
5. _____ It is made up of the Sun, planets, their moons, and meteors.
6. _____ It is found between the inner and outer planets.

Choose a word from the word box above that describes the words in each group.

<table>
<thead>
<tr>
<th>Planet</th>
<th>Planet</th>
<th>Asteroid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>Jupiter</td>
<td>asteroid</td>
</tr>
<tr>
<td>Venus</td>
<td>Saturn</td>
<td>comet</td>
</tr>
<tr>
<td>Earth</td>
<td>Uranus</td>
<td>meteorite</td>
</tr>
<tr>
<td>Mars</td>
<td>Neptune</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pluto</td>
<td></td>
</tr>
</tbody>
</table>
Fill in the blanks.

Earth is one of many planets that are part of our solar system. Large balls that orbit the Sun are ______________ . They change positions in the sky because they revolve around the ______________ . You can also find one or more ______________ that orbit each planet. Planets closest to the Sun are ______________ , ______________ , ______________ , and ______________ . These small planets are made up of ______________ rock-like material. Planets that are ______________ from the Sun are Jupiter, Saturn, Uranus, Neptune, and Pluto. Besides planets and their moons, our solar system has ______________ , ______________ , and ______________ . The Sun is at the center of our ______________ . It is actually a ______________ . It is a hot, glowing ball of gases.
Telescopes: Discovering the Solar System

Use your textbook to help you fill in the blanks.

What is a telescope?
1. One tool scientists use to study objects and places in space is a(n) _____________________.
2. A telescope gathers light to make faraway objects appear _____________________, _____________________, and _____________________.
3. A telescope has _____________________ that gather light.
4. A curved piece of glass is called a(n) _____________________.
5. One of the best places for a telescope is in _____________________.
6. One telescope that travels around Earth is the _____________________ telescope.
7. The Hubble telescope takes pictures of our solar system and sends them back to _____________________.
8. As the Hubble telescope travels around Earth, it can see objects _____________________.
9. Special telescopes can detect _____________________, _____________________, or _____________________ from space.
How did we learn about space?

10. At first, people believed that the _________________ circled ________________ .

11. In 1543, Copernicus said that the _________________, not _________________, was the center of the solar system.

12. In 1609, _________________ used his telescope to discover evidence that _________________ .

13. Since 1609, scientists have seen the planets _________________, _________________, and _________________.

14. Scientists have also learned that there are _________________ in the sky.

Summarize the Main Idea

15. How have telescopes helped scientists learn about our solar system?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Telescopes: Discovering the Solar System

Who am I? What am I?

Choose a word from the word box above that answers each question.

1. I am a large planet that rotates on its side. Scientists saw me through telescopes. Who am I? _____

2. I am a curved piece of glass. What am I? _____

3. I am the person who said the Sun was the center of the solar system. Who am I? _____

4. I travel around Earth taking pictures of our solar system. What am I? _____

5. I have a Green Dark Spot on me. Scientists saw me through telescopes. Who am I? _____

6. I used a telescope to discover evidence that Earth orbits the Sun. Who am I? _____

7. I am a tool scientists use to make objects appear closer, clearer, and larger. What am I? _____

8. I am a planet so far away that very little is known about me. Scientists see me through telescopes. Who am I? _____
Scientists study space with many kinds of telescopes. These special tools allow scientists to see distant objects ________________, ________________, and ________________. Telescopes gather light with ________________. Each lens is a curved piece of ________________. Back in 1609, Galileo used his ________________ to discover evidence that ________________ orbits the ________________. Scientists have used pictures from the ________________ to learn more about our solar system. They have learned that there are ________________ of stars. They also have learned the existence of three planets: ________________, ________________, and ________________. Besides light, telescopes can gather other information from space such as ________________, ________________, or ________________.
The Stars

Use your textbook to help you fill in the blanks.

What are stars?
1. An example of a medium-sized star is ______________________ .
2. The Sun looks larger than most stars because ______________________ .
3. Star-like objects that move in the night sky are ______________________ .
4. Because planets, including Earth, move in their orbits, the positions of the planets ______________________ .
5. You can see more stars through a ______________________ than you can see with ______________________ .

What is a constellation?
6. Groups of stars that form a pattern or picture are called a ______________________ .
7. To many people, star patterns looked like ______________________ or ______________________ .
8. You can see constellations move in the sky throughout the night because ______________________ .
9. Scientists use the names of ______________________ constellations to group the stars.
Why do we see different stars during different seasons?

10. As Earth travels around the Sun, different constellations of _______ appear each month.

11. Summer and winter skies are _______.

12. You can see the constellation Orion only in the _______.

13. If you look out into space at night, you are looking _______.

14. If you look out into space at daytime, you are looking _______.

Summarize the Main Idea

15. What are two reasons why people gave names to constellations?

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________
The Stars

a. binoculars  
b. constellation  
c. magnify  
d. Orion  
e. planet  
f. rotate  
g. star  
h. Sun  
i. telescope

Match the correct letter with the description.

1. _____ A hot, glowing ball of gases
2. _____ A name of a constellation
3. _____ A medium-sized star
4. _____ A pattern or picture outlined by stars
5. _____ A tool to magnify the stars
6. _____ To turn or to revolve
7. _____ A tool to magnify scenery
8. _____ A large ball in space that orbits the Sun
9. _____ To make larger
Fill in the blanks. You will use one of the words twice.

Every night the stars come out. The stars are always in the sky, even ________________ the day. Different stars appear during different ________________ . Because Earth rotates on its axis, stars appear ________________ but actually do not. You can see more stars through a ________________ than with your eyes. Long ago, people thought that groups of stars reminded them of ________________ or ________________ . They gave names to groups of stars to make sense of the ________________ . Orion, the Big Dipper, and the Little Dipper are names of ________________ . People used constellations to help them tell ________________ , ________________ , and ________________ . Today, scientists still use the names of 88 constellations.
Meet Orsola De Marco

When you look at a star, do you ever wonder about its life? Orsola de Marco does. She’s a scientist at the American Museum of Natural History in New York. Orsola studies stars that are found together in pairs. As far as we know, our Sun is a star that stands alone. But most stars in the universe have a partner. They are called binary stars.

Of course Orsola can’t go to the stars. So, she travels to Arizona, Hawaii, and Chile to use large telescopes. She gazes billions of miles into space to get a good look at binary stars. She watches how the stars influence each other. When a star gets old, it becomes larger. If there is another star nearby, it might get eaten up, or absorbed, by the expanding old star. No one is sure what will happen after that. Will the smaller star just disappear? Orsola is working to find out.
A Summary
- identifies the subject
- states the main idea
- gives the important details

Write About It
Summarize What would you study if you were an astrophysicist? Choose something you would like to study in space and write about it. Summarize some things you would like to learn. Tell why this interests you.

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
Write About It

Write a paragraph that summarizes “Stars to Freedom.” Include a topic sentence that states the main idea about the piece. Then in your own words, tell the most important facts and details from “Stars to Freedom.” Be brief, but explain how people used the Big Dipper to travel to freedom.

Getting Ideas

Make sure you know what a summary is before you begin to write. Read each sentence below. Write True or False.

1. A summary is shorter than the article. ________________
2. A summary is longer than the article. ________________
3. A summary uses your own words. ________________
4. A summary uses the exact words from the article. ________________
5. A summary contains both important and unimportant details. ________________
6. A summary contains only important information. ________________
Drafting

Write the main idea of “Stars to Freedom” on the lines below.


Now write your summary. Begin with a topic sentence that tells your main idea. Include only important facts and details. End with a conclusion based on these facts.


Revising and Proofreading

Here are some sentences from one student’s summary. Find nine places where there should be a capital letter. Correct these errors.

“Stars to Freedom” shows how enslaved African Americans used the stars to find freedom in the north. The handle of the big dipper points to the north star. They used the folk song “follow the drinking gourd” as a code.

Now revise and proofread your summary. Ask yourself:

• Did I include only important facts and details?
• Did I draw a conclusion at the end?
• Did I correct all grammar errors?
A Closer Look at the Solar System

Choose the letter of the best answer.

1. What is a small piece of ice and rock orbiting the Sun?
   a. comet                    c. meteor
   b. constellation           d. planet

2. A pattern outlined by stars is a(n)
   a. asteroid.                             c. meteor.
   b. constellation.                       d. solar system.

3. A star and all the objects orbiting around it is a(n)
   a. asteroid.                             c. meteor.
   b. constellation.                       d. solar system.

4. A lens is a(n)
   a. constellation.
   b. curved piece of glass.
   c. kind of telescope.
   d. light in space.

5. What is a smaller piece of rock or metal orbiting the Sun?
   a. asteroid                        c. meteor
   b. constellation                   d. planet
Choose the letter of the best answer.

6. A small piece of rock burning up in Earth’s atmosphere is a(n)
   a. asteroid.  
   b. comet.  
   c. constellation.  
   d. meteor.

7. A large ball of rock in space orbiting the Sun is a(n)
   a. comet.  
   b. constellation.  
   c. planet.  
   d. star.

8. A tool that gathers light to make objects appear larger is a(n)
   a. constellation.  
   b. microscope.  
   c. radio wave.  
   d. telescope.

9. A very hot, glowing ball of gases in space is a(n)
   a. asteroid.  
   b. comet.  
   c. meteor.  
   d. star.
Matter

Complete the concept map with the information you learned about matter in Chapter 6.

Building Blocks

Physical Changes

Matter

Types

Solid

Liquid

Gas

Chemical Changes
Freezing Rain

Read the Literature feature in your textbook.

Write About It

Response to Literature During the winter, rain freezes into ice. What word does the author use in the poem to describe ice? What are some words that describe things around you? Choose an object to write about. Use as many words as you can to describe the object.
Solids, Liquids, and Gases

Use your textbook to help you fill in the blanks.

**What is Matter?**

1. Matter is anything that has mass and _________________.
2. Mass is the amount of _________________ an object has.
3. If two objects are the same size and shape, but one has more matter, it has more _________________.
4. An object’s _________________ are ways to describe it, including color and texture.
5. Mass, one of many properties that can be measured, can be measured with a _________________.

**How do we classify matter?**

6. Three states that matter can be grouped into are _________________.
7. Solids have a definite _________________ and shape.
8. Volume is the amount of _________________ an object takes up.
9. Liquids have a definite volume, and _________________ shape.
10. Gases have no definite _________________.
What happens when heat is added to matter?

11. When heat is added to matter, it gains ______________ .

12. When a substance gains energy, its ______________ increases.

13. When heat energy is added to a solid, it will ______________ , becoming a liquid.

14. When heat is added to a liquid, it will ______________ , becoming a gas.

15. When heat is taken away from matter, it loses ______________ and its temperature decreases.

16. When a liquid loses heat energy, it freezes, and becomes a ______________ .

17. When gases lose heat energy, they become liquids by ______________ .

Summarize the Main Idea

18. What are the three states of matter and how does heat affect a substance’s state of matter?

________________________________________________________________________________

________________________________________________________________________________

________________________________________________________________________________

________________________________________________________________________________

________________________________________________________________________________

________________________________________________________________________________
Solids, Liquids, and Gases

a. condense  
b. evaporate  
c. gas  
d. liquid  
e. mass  
f. matter  
g. melt  
h. solid

Match the correct letter with the description.

1. _____ The amount of matter in an object
2. _____ When a gas becomes a liquid
3. _____ Carbon dioxide is one, because it takes the shape and volume of its container.
4. _____ When a liquid becomes a gas
5. _____ Your pen is one, because it has a definite volume and shape
6. _____ A glass of lemonade is one, because it takes the shape of its container, but has a definite volume
7. _____ When a solid becomes a liquid
8. _____ Anything that has mass and takes up space
Fill in the blanks. Some answers may be used more than once.

Everything that you are able to see, touch, smell, and feel is matter. Matter is anything that has ________________ and takes up space. ________________ can be classified according to its state. A ________________ piece of matter has definite volume and shape. A ________________ has no definite shape, but a definite volume.

A ________________, such as oxygen, has neither a definite volume nor shape. When ________________ energy is added to matter, changes to its state may occur. For instance, when a solid piece of ice is heated, it may melt, becoming a liquid. When heat is added to a liquid, it can evaporate, becoming a ________________. When heat is taken away, a liquid can freeze, becoming a ________________. When heat is taken away from a gas, it can ________________, becoming a liquid.
Building Blocks of Matter

Use your textbook to help you fill in the blanks.

What are elements?
1. Everything is made up of _________________.
2. ________________ make up matter.
3. Matter can be made up of ________________ elements.
4. When elements combine to form new substances, the resulting substances have ________________ properties.

What are atoms?
5. No matter how small you divide an element into pieces you are able to see, it will have ________________ properties.
6. Scientists must use special microscopes called ________________ in to order to see the atom.
7. The smallest part of matter that keeps its properties is an ________________.
8. All of an element’s atoms have the same ________________ as the element.

How do we arrange elements?
9. A periodic table shows all of the _________________.
10. Each element in the ________________ is represented by a symbol.
11. Other information in the periodic table includes an element’s _________________.
12. Elements in the same column of the periodic table share common _________________.

© Macmillan/McGraw-Hill
13. Elements on the left side of the periodic table are usually ________________.

14. Hydrogen can be found on the left side of the periodic table, but it is a ________________.

Summarize the Main Idea

15. What are elements and how do scientists organize them?

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________
Building Blocks of Matter

a. atom  d. matter  g. periodic table
b. electron microscope  e. metals
c. elements  f. non-metals

Match the correct letter with the description.

1. _____ A device that allows scientists to see the smallest parts of matter
2. _____ Everything we can see, touch, and feel.
3. _____ The smallest part of an element that has all of the element's properties.
4. _____ All matter is made up of these.
5. _____ A chart containing information for every element known.
6. _____ These elements are found on the right side of the periodic table.
7. _____ These elements, including iron, are found on the left side of the periodic table.
Cloze Test

Building Blocks of Matter

Atoms | Metals | Smallest
Elements | Periodic Table | Properties

Fill in the blanks.

Everything that we know of is made up of matter. All matter is made up of _____________ . Some matter, such as oxygen, is made up of only one element. Other matter is made up of more than one element joined together. Water is made up of the elements hydrogen and oxygen. The _____________ part of an element that still keeps the element’s properties is an atom. Because they are too small to see with the human eye, scientists study _____________ using tools like the electron microscope.

Scientists group all of the elements in a chart called the _____________ . The periodic table also contains information about groups of elements. On the periodic table, a column of elements have similar _____________ . For instance, _____________ are found on the left side of the periodic table and nonmetals are found on the right side. The periodic table is a tool where you find out many properties of elements.
Meet a Scientist

Meet Neil deGrasse Tyson

Did you know that you are “star dust”? Neil deGrasse Tyson can tell you what that means. He’s a scientist at the American Museum of Natural History in New York.

Your body is full of hydrogen, carbon, calcium and many other atoms. All these atoms were first formed in the stars a long time ago. So were the silicon, iron, and oxygen atoms that form most of the Earth’s inside.

How did these elements make their way from the stars to your body?

Most elements form inside the fiery and dense centers of stars. Hydrogen, the simplest of the elements, combines to form helium, carbon, and all the other elements in these conditions. Throughout their lives, stars scatter elements into space. Over millions of years, these elements combine to form new stars, or planets, or even living things, like you!

Neil deGrasse Tyson is an astrophysicist, a scientist who studies how the universe works.
Main Idea and Details

The Main Idea
• tells the most important message of the text.
• is supported by details, facts, and examples.

Write About It
Main Idea Think of a question you would like to ask scientist Neil deGrasse Tyson. Research and write about the tools that scientists use to discover facts about elements in the universe.
Building Blocks of Matter

Read the Writing in Science feature in your textbook.

Write About It

Write a paragraph telling about the building blocks of matter. Begin your paragraph with a topic sentence. This sentence should state the main idea. Then include facts and details that support the main idea or add more information about it. End with a conclusion based on your facts and details.

Getting Ideas

Do some online and print research. Find facts about the building blocks of matter.

Planning and Organizing

Write two sentences that tell about the building blocks of matter.

1. ____________________________________________

2. ____________________________________________
Drafting

Write a topic sentence for your paragraph.

________________________________________________________________________

Now write the first draft of your paragraph on a separate sheet of paper. Begin with your topic sentence. Tell facts and details about the building blocks of matter. Draw a conclusion at the end.

Revising and Proofreading

Proofread these sentences that Carlos wrote. Each sentence has a grammar error. Find the error and correct it. Write the correct sentence on the line.

1. All the atoms in an element is alike.

________________________________________________________________________

2. Two atoms of hydrogen and one atom of oxygen combines to form water.

________________________________________________________________________

Now revise and proofread your paragraph. Ask yourself:

• Did I begin with a topic sentence that tells my main idea?
• Did I include facts and details to back up my main idea?
• Did I draw a conclusion at the end?
• Did I correct all grammar errors?
Changing Matter

Use your textbook to help you fill in the blanks.

What are physical changes?
1. When matter changes only in ways that you can see, such as getting smaller, it has gone through a ________________.
2. When something goes through a physical change, its properties ________________.
3. When a solid becomes a liquid, it goes through a ________________ change.
4. When water boils, becoming steam, this is a ________________ change.
5. When you mix different types of matter together and their properties do not change, you have created a ________________.
6. Mixing oil and vinegar together to make salad dressing is an example of a ________________ change.
7. When someone pours milk into their coffee, they have created a ________________.
8. Stirring an egg is an example of a ________________ change.

What are chemical changes?
9. When substance goes through a change where new matter is created, it is a ________________ change.
What are the signs of a chemical change?

10. Light and heat may be produced during a ____________.

11. When a substance changes ______________ , for example, when iron rusts and turns brownish-red, this is a sign that a chemical change has occurred.

12. If you see bubbles form when two substances are combined, this indicates that a ______________ has formed, another sign that a chemical change has occurred.

13. When fireworks explode, ______________ and heat indicate a chemical change has occurred.

14. Cooking an egg is an example of a ______________ change.

Summarize the Main Idea

15. Describe the two ways that matter can change. How can you tell which type of change has occurred?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Changing Matter

a. burning
d. mixture
g. spoils
b. chemical change
e. physical change
c. elements
f. rust

Match the correct letter with the description.

1. _____ Matter changes, but its makeup does not change.
2. _____ This chemical change results in the formation of light and heat.
3. _____ When fruit does this, it is a chemical change of the matter.
4. _____ Matter changes, and its properties and makeup also change.
5. _____ A combination of matter, such as salt water, in which the makeup remains the same
6. _____ The building blocks of matter
7. _____ This occurs when iron materials are left outside and undergo a chemical change.
Fill in the blanks.

Every day, we see matter change. For example, if you tear a piece of paper, the paper undergoes a _________. The ___________ and properties of the matter do not change.

Another physical change that we can see is when an ice cube _________. A ___________ causes a ___________ substance to be made. When a log burns, the ashes that are formed are a different type of ___________ than the original wood. There are many ways to observe that a chemical change has occurred in matter. For example, when we see a piece of paper burning, we see ___________ and feel heat.

Color change is another observation. Finally, if you see a ___________ released, you know that a chemical change has occurred. These changes in the matter indicate that the substance is now a new type of matter.
Matter

1. Your body, desk, and the air you breathe are all
   a. gases.       c. matter.
   b. liquids.     d. solids.

2. An atom
   a. is very large.
   b. is always a liquid or a solid.
   c. is the smallest unit of an element.
   d. only experiences physical changes.

3. The building blocks of matter are best described as
   a. elements.       c. mass.
   b. gases.          d. solids.

4. Which of the following shows that a chemical change has happened?
   a. a torn sheet of paper
   b. a piece of spoiled fruit
   c. water freezing into ice
   d. a mixture of tea and water

5. When ice melts, water becomes
   a. a gas.          c. a solid.
   b. a liquid.       d. a powder.

6. What is the measure of matter in an object?
   a. mass
   b. shape
   c. size
   d. weight
7. A liquid has
   a. definite shape and volume.
   b. no definite shape or volume.
   c. definite shape.
   d. definite volume.

8. When a liquid gains heat energy it can
   a. condense.        c. freeze.
   b. evaporate.       d. melt.

9. Which of the following is NOT a physical change in matter?
   a. A new substance was formed after a reaction.
   b. Matter changed from a liquid to a solid.
   c. Matter formed a gas when heat energy was added.
   d. Substances have the same properties after they are mixed.

10. What has happened when condensing occurs?
    a. Heat was added to a solid.
    b. Heat was added to a liquid.
    c. A gas has lost heat energy.
    d. A solid has lost heat energy.

11. The periodic table is a chart that shows a list of
    a. atoms.        c. only gases.
    b. elements.     d. only solids.
Energy

Complete the concept map with the information you learned about energy. Some answers have been written for you.

Energy

Types

- kinetic
- potential

Forms

- chemical
- mechanical

Movement
Wind Power

Read the Literature feature in your textbook.

Write About It
Response to Literature
This article tells about wind farms that create electricity. What do you think people do with the energy that is produced? Write a letter to a friend. Describe the ways that you use energy.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Energy All Around

Use your textbook to help you fill in the blanks.

What is energy?
1. Energy is the ability to do __________________________.
2. All living things need energy to __________________________.
3. __________________________ enables things to move and grow.
4. When a solid block of ice gains energy, it melts, which is a __________________________ change.
5. Burning a piece of paper is an example of energy causing matter to undergo a(n) __________________________ change.

What are some forms of energy?
6. Gasoline, batteries, and food all contain __________________________.
7. Computer printers use __________________________ energy.
8. The hotter something becomes, the more __________________________ it has.
9. Moving objects contain __________________________.
10. Energy can be converted from one form to another. For instance, when a fire burns, chemical energy in wood is converted to __________________________ and heat energy.

What is Earth’s main source of energy?
11. Earth’s main source of energy is the __________________________.
12. Different areas of Earth receive more direct sunlight because of Earth’s __________________________.
13. We see the Sun’s energy in the form of __________________________.
14. We feel the Sun’s energy in the form of _________________.
15. Plants use light energy from the Sun to make _________________.

How does the Sun’s energy change matter?
16. ________________ energy from the Sun causes matter to gain thermal energy.
17. When ice gains heat energy, it melts and becomes a _________________.
18. When liquid water such as a puddle gains heat energy, it ________________ and becomes a gas.

Summarize the Main Idea
19. What is energy? What is the main source of Earth’s energy?

______________________________________________________________

______________________________________________________________
# Energy All Around

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a. chemical energy</td>
<td>d. friction</td>
<td>g. thermal energy</td>
</tr>
<tr>
<td>b. electrical energy</td>
<td>e. light energy</td>
<td></td>
</tr>
<tr>
<td>c. energy</td>
<td>f. mechanical energy</td>
<td></td>
</tr>
</tbody>
</table>

Match the correct letter with the description.

1. _____ The more of this an object has, the warmer it becomes.

2. _____ This energy is stored in matter.

3. _____ This energy is found in running water.

4. _____ This energy is seen coming from a lamp that is switched on.

5. _____ This is the ability to do work.

6. _____ This energy occurs in plugged-in items such as a vacuum.

7. _____ This force opposes motion when two objects are touching.
Energy all Around

<table>
<thead>
<tr>
<th>chemical</th>
<th>light</th>
<th>physical</th>
</tr>
</thead>
<tbody>
<tr>
<td>electrical</td>
<td>matter</td>
<td>Sun</td>
</tr>
<tr>
<td>heat or thermal</td>
<td>mechanical</td>
<td>work</td>
</tr>
</tbody>
</table>

Fill in the blanks.

When you feel tired, you may feel like you have no energy. Energy is the ability to do _________________. Energy can make ________________ undergo both physical and chemical changes. When heat energy is added to a block of ice, for instance, it melts. Melting is a ________________ change. When a piece of paper burns because it gains energy from a fire, it undergoes a ________________ change. ________________ energy enables us to watch television. When we are cold, we have less ________________ energy than when we are warm. When things are moving, they have ________________ energy. The main source of Earth’s energy is the ________________. We see the Sun’s energy as ________________ and feel it as heat. The Sun’s energy can cause other changes in matter as well.
Using Energy

Use your textbook to help you fill in the blanks.

What are potential energy and kinetic energy?
1. The energy stored in objects is called _________________.
2. The higher up a resting object is, the _________________ potential energy it has.
3. The energy that moving objects have is called _________________.
4. A rolling bowling ball contains _________________.
5. An object sitting on top of a hill has more _________________ than an object sitting at the bottom of the hill.
6. A chair has _________________.

What are some sources of stored energy?
7. A battery contains stored _________________ energy.
8. When a battery-operated lantern is turned on, the stored chemical energy is first converted to _________________ energy.
9. Electrical energy in a lamp is converted into light _________________ energy.
10. A match also has stored _________________ energy.
11. When its potential energy is used up, a match _________________.
12. The food we eat has _________________.
13. We use the energy in _________________ to do all the things that keep us alive.

**How is stored energy changed?**
14. A gas stove converts the energy stored in natural gas to _________________ energy.
15. An automobile engine changes the chemical energy stored in gasoline into _________________ energy.
16. We also convert stored energy into _________________ when we break down the food we eat and are able to walk around the room.

**Summarize the Main Idea**
17. What is the difference between potential energy and kinetic energy?

__________________________________________________________________________

__________________________________________________________________________
Using Energy

Match the correct letter with the description.

1. _____ An object that has a lot of this feels hot.
2. _____ This type of energy is found in food.
3. _____ Chemical energy is found here.
4. _____ This is the movement of an object.
5. _____ This is the ability to do work.
6. _____ A moving object has this energy.
7. _____ This is stored energy.
All objects can be considered to contain energy. Objects that are not moving, such as a ball resting on the floor, contain stored energy called ________________ energy. When a ball rolls across the floor, it is an object in motion, so it has ________________ energy. There are many sources of ________________ energy. A battery also contains stored ________________ energy. This stored energy can be released to provide ________________ that is then converted to light, sound, or other forms of energy. Automobiles are able to ________________ stored energy into energy that enables them to drive down the street. People use the energy stored in ________________ to walk, run, and jump. When we move, we are using ________________. That kinetic energy comes from the food we eat, which has ________________.
Turning the Power On

People use a lot of energy. We need it to power our cars, heat our homes, and run the many machines we use each day. Energy sources like coal or oil are limited. When they’re used, they are gone forever. But other sources are renewable. Renewable means they can be used again and again. Here’s a look at how people have used these alternative energy sources over time.

1882  Hydropower Energy
The river current turns the mill wheel, which turns a machine called a turbine. The turbine transforms the river’s energy into electricity.

1890  Wind Energy
Wind turbines are invented in Denmark. These machines use the energy of the wind to create electricity.

1904  Geothermal Energy
Heat energy from Earth is harnessed from geysers in Italy. Steam from the geysers turns turbines, which produce electricity.

1904  Solar Energy
Russell Ohl invents a device that transforms light from the Sun into electricity.

1904  Biomass Energy
Biomass consists of dead trees, tree branches, yard clippings, and leftover crops, as well as wood chips, bark, and sawdust from lumber mills. It can even include used tires and livestock manure. These materials are burned to produce heat, steam, or electricity.
To draw a conclusion you must
• read the story completely
• understand the story details
• make connections among story details

Renewable energy sources can be replenished in a short period of time. The five renewable sources used most often are hydropower (water), wind, geothermal, solar, and biomass. No matter what energy source you use, it’s important to conserve electricity. That means turning off the light when you leave a room.

Write About It

Draw Conclusions What do you think is the author’s purpose for writing this article? In the last paragraph, the author tells us we must all do our part in saving electricity. What are some ways you can reduce the amount of electricity you use? Write about ways you can use less electricity.
Conserving Energy

Write About It
Write a persuasive letter to a community leader. Tell your opinion about why it is important to save gas. Give strong reasons, facts, and examples that will convince your reader. Save your best reason for last. Be sure to follow the form of a formal letter.

Getting Ideas
Brainstorm ideas about why it is important to save gas. Write them on a separate sheet of paper.

Planning and Organizing
Here are some sentences Armando wrote to support the opinion that we must save gas. Write Yes by each sentence that supports this opinion. Write No by each sentence that does not.

1. Taking buses and trains instead of cars will help us save gas. ________________
2. There will be more and more gas shortages if we don’t start conserving gas. ________________
3. Gas is a renewable resource. ________________

Write two sentences giving facts, reasons, and details for saving gas.

1. ____________________________
   ____________________________
2. ____________________________
   ____________________________
Use the guidelines below to write your letter.

1. This is the heading. Write your address and the date.

2. This is the inside address. Write the name of the person to whom you are writing, the organization, and the address.

3. This is the salutation, or greeting. Write “Dear” and the name of the person. Put a colon after the name.

4. Explain why you are writing. State your position.

5. Give facts, reasons, and details that back up your opinion.

6. Tell what you want the reader to do.

7. This is the closing. Use special words like “Sincerely” or “Yours truly.” Put a comma after these words.

8. Sign your name. If you are writing on computer, type your name under your signature.

Now revise and proofread your letter. Ask yourself:

- Did I follow the form of a formal letter?
- Did I tell my opinion about saving gas?
- Did I include facts, details, and reasons to back up my opinion?
- Did I end by saying what I want the reader to do?
- Did I correct all grammar errors?
- Did I correct all spelling, punctuation, and capitalization errors?
Energy on the Move

Use your textbook to help you fill in the blanks.

How can energy move through objects?
1. Moving objects have _______________ energy.
2. Objects in motion are able to _______________ their energy to another object.
3. If a rolling ball hits a block of wood, some of its kinetic energy is transferred to _______________.
4. If an object gains kinetic energy from another object, it may _______________.
5. In basketball, _______________ energy from your arm is transferred to the ball when you throw it to another player.

How is energy transferred by waves?
6. A _______________ is a disturbance that moves through a substance such as water or air.
7. Waves carry _______________, which they can transfer to objects.
8. Ocean waves are _______________ waves; they move up and down.
9. Ocean waves cause floating objects to move _______________.

How does sound energy move?
10. Sound is a type of _______________ energy.
11. When objects move back and forth very quickly, they _______________.
12. Vibrating objects produce _______________ energy.

13. Sound waves are called _______________ waves because they compress or squeeze and then release the air they move through.

14. Sound waves move _______________.

15. When sound waves strike an object, they may cause it to _______________.

16. The faster the sound waves travel, the _______________ pitch of sound you will hear.

**How does electrical energy move?**

17. Electrical energy moves through _______________.

18. When you plug in a hair dryer, you are connecting the wire in the cord with the wire in the outlet, allowing the _______________ energy to flow into your hair dryer.

19. The electrical energy traveling into your hair dryer is converted to the mechanical and _______________ energy you use to dry your hair.

**Summarize the Main Idea**

20. Describe three ways energy can be carried from one location to another.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Energy on the Move

Match the correct letter with the description.

1. _____ A disturbance that moves horizontally as the matter in the disturbance moves up and down
2. _____ A disturbance that moves through a substance
3. _____ A wave that moves matter back and forth in the same direction that the wave is traveling
4. _____ The energy of moving objects
5. _____ The energy of vibrating objects
6. _____ A wave that travels from an earthquake
7. _____ The energy of electric currents

a. compression wave  d. seismic wave  g. wave
b. electrical energy  e. sound energy
  c. mechanical energy  f. transverse wave
There are several ways in which energy can be moved from one location to another. Moving objects ___________ energy to the objects they come into contact with. For example, a moving hockey stick transfers some of its kinetic energy to a hockey puck, causing it to ___________. ___________ are disturbances that move in a regular pattern through matter or space. When you float in the ocean, you move ___________ as a wave passes you. The wave has transferred some of its energy to you, causing you to move in the ___________ direction as the wave. Sound waves also transfer ___________. Sound waves are produced by ___________ objects. When ___________ waves strike a person's eardrum, they cause it to vibrate. This transfer of energy enables us to ___________. Electrical energy can also carry energy as it moves through a ___________.
Energy

Choose the letter of the best answer.

1. Objects that vibrate produce
   a. electrical energy.
   b. potential energy.
   c. sound energy.
   d. work energy.

2. What kind of energy is potential energy?
   a. motion
   b. sound
   c. stored
   d. work

3. Moving charges are
   a. electrical energy.
   b. potential energy.
   c. sound energy.
   d. work energy.
Choose the letter of the best answer.

4. Energy is
   a. a change in matter.
   b. a flash of light.
   c. the ability to do work.
   d. motion in space.

5. A disturbance that moves through matter or space is a(n)
   a. energy.
   b. force.
   c. sound.
   d. wave.

6. The energy of motion is
   a. kinetic energy.
   b. work energy.
   c. potential energy.
   d. electrical energy.
Light

Complete the concept map about the types of light and how light travels. Some answers have been written for you.

Light

Types

Visible

• flashlight

Invisible

•

Travel

in transverse waves
Crystal Vision

Read the Literature feature in your textbook

Write About It

Response to Literature  The poet tells about an experience he had with light. How did the experience make him feel? Write a personal narrative about an experience you have had with light. It might be a rainbow, a sunrise, or a sunset. Tell how you felt about the experience and why it is memorable.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
How Light Moves

Use your textbook to help you fill in the blanks.

What is light?
1. Light is a form of ________________ .
2. Waves can transfer energy from one place to another. Both ________________ and ________________ transfer energy in a wave-like motion.

What is the electromagnetic spectrum?
3. Radio waves transmit signals for ________________ , ________________ , and ________________ .
4. Microwaves can ________________ food and forecast ________________ .
5. Infrared waves produce ________________ that we feel from sunlight, fire, radiators, and warm sidewalks.
6. ________________ waves can tan and burn your skin.
7. Doctors take pictures of bones with ________________ .
8. ________________ use dangerous radioactive materials that have high-energy gamma waves.

What is visible light?
9. The beam of a flashlight, the flash of a camera, the glow from a lightbulb, and the flame of a candle are all examples of visible light, or light we can ________________ .
What is invisible light?
10. Your eyes cannot see __________________ or __________________ , but they can see the effects of these waves.

How does light travel?
11. All light energy is alike because it always __________________ .
12. Even light energy from the Sun travels __________________ through space in __________________ .

What is reflection?
13. Reflection is the light that __________________ .
14. A mirror reflects all light striking it because it has a __________________ , __________________ surface.

What happens when light hits a rough surface?
15. When light hits a rough surface, it bounces back and scatters in __________________ , and then a clear __________________ or picture does not form.

Summarize the Main Idea
16. Briefly explain what light is, how light travels, and how light can form an image.
How Light Moves

Use the clues below to help you fill in the puzzle with the correct words.

Across
1. Light from the beam of a flashlight, the flash of a camera, etc.
3. Waves that transmit signals for cellular phones, radios, and televisions
6. The light that bounces off objects
7. Invisible light energy that can take pictures of bones
8. Light waves that can tan or burn skin

Down
2. The picture that can form from reflected light
4. Waves that we feel as heat
5. Light energy that forecasts weather and cooks food
9. Visible or invisible form of energy that travels by waves in straight lines
How Light Moves

Fill in the blanks.

Light is a form of energy. Visible or invisible, light travels by _____________ in _____________ lines.

A _________________ occurs when light bounces off an object.

Light bouncing off a smooth, shiny _________________, forms a picture called an _________________. However, when light bounces off a rough surface, it _________________, and a clear image does not form. The various types of electromagnetic light waves behave differently. High-energy gamma waves are found in hazardous radioactive materials used in _________________.

After time in the sun, _________________ waves may tan or burn our skin. _________________ waves transmit signals for cell phones, radios, and TVs. _________________ can forecast weather and cook food. A dentist might make a(n) _________________ of our teeth.
Seeing Light and Color

Use your textbook to help you fill in the blanks.

How do you see?
1. When reflected light enters your eyes, you see an
   ________________________.
2. The ________________________ is the clear outer covering
   of the eye.
3. Light passes through the ________________________ and enters
   the ________________________ an opening into the eye.
4. When there is a lot of light, pupils become
   ________________________, but they grow
   ________________________ as the amount of light
   ________________________.
5. Located ________________________ the pupil and the iris, the
   ________________________ focuses incoming light on the back
   of the eyeball.

Why can you see colors?
6. When white light separates, ________________________ of
   color appear.
7. White light is made up of ________________________ different
   colors: __________ , __________ ,
   __________ , __________ , __________ , __________ ,
   __________ , and __________ .
8. When white light strikes an object, some colors of light
   are ________________________ or taken in, while others are
   ________________________.
9. The light reflected from an object enters the pupil so that when you look at the object, you see the object as the color of the _________________.

10. When ________________ light strikes a leaf, the leaf ________________ all of the colors except for green.

11. The green light bounces off the leaf and is ________________ to your eyes so that you see the leaf as green.

Why do objects appear black or white?

12. A tar road appears black because all the colors from the white light are ________________ and almost ________________ is reflected.

13. A snowman, on the other hand, appears white because when white light strikes a snowman, ________________ are reflected, and ________________ is absorbed.

Summarize the Main Idea

14. Briefly explain how we see light and color.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Seeing Light and Color

Use the clues below to help you find the words hidden in the puzzle.

B O A H G A W D S N
L G B V L R I A T I
R C S W E S P C O R
F D O O N I L R M E
T I R I S U Q U L F
M N B X K P U P I L
Y H E C O R N E A E
L P D E S S E G N C
W H I T E L I G H T
Z A S D E N F T O J

1. What happens to colors and light that have been taken in

2. The clear outer covering of the eye

3. The colored circle that surrounds the pupil

4. The part of the eye that focuses incoming light

5. An opening into the eye

6. To bounce light off an object

7. Light that is made up of seven different colors
Fill in the blanks.

Light strikes an object, and then some of that light is reflected. If reflected light enters your eyes, you will see an image and color.

__________________ is made up of ____________________ different colors. When white light hits an object, some colors making up white light are ________________, and others are reflected, or sent back. Black objects, such as a tar road, absorb all the colors of light so that almost no light is _________________. That is why the road will look black. ________________ objects cause all colors to be reflected so that no light is absorbed. The eye works by first taking in reflected light through the ________________, which is an opening to the eye. The ________________ is the colored circle surrounding the pupil, and it changes the ________________ of the pupil by determining how much light it allows in. The ________________ focuses light at the back of the eyeball to form an image. The ________________ is the clear outer covering of the eye.
A Beam of Light

Surgeons are doctors who perform operations to fix injuries or treat diseases. They use scalpels, special tools with sharp blades, to cut through tissues such as skin, muscles, and organs. Today, they have another tool they can use to do operations that were impossible in the past. That tool is a beam of light!

This beam of light is called a laser. Not many people know that LASER stands for Light Amplification by Stimulated Emission of Radiation. Lasers are very powerful and precise. Lasers can cut through tissue without causing a lot of blood loss.

First, lasers were used to fix marks on children’s skin. Today, surgeons also use lasers to treat injuries to the brain, the heart, and many other places in the human body. Lasers are even used to help people see better.

Doctors perform laser eye surgery on people who have vision problems. The laser is tapped, or “pulsed,” on the surface of the eye to change its shape. After the surgery, the patient’s vision is improved and they usually won’t have to wear glasses or contact lenses.
A problem and solution involves

• identifying the problem
• isolating the causes
• proposing solutions

Write About It

Problem and Solution Lasers can currently be found in many fields of study. Research and write about different ways lasers are being used.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Shadows

Use your textbook to help you fill in the blanks.

How are shadows formed?

1. _______________ objects block the movement of light.

2. If light energy is blocked, a _______________ or dark space forms.

3. Shadows form on the side of the object facing _______________ from the light source.

4. To see an object, _______________ light must enter your eyes. Opaque materials can stop you from seeing objects because they _______________ light, so you do not see the object.

How are shapes and sizes of shadows formed?

5. A shadow is the darker area that forms when an opaque object blocks _______________.

6. If you play outside on a sunny day, your _______________ will block sunlight.

7. Shadows forming on that sunny day would have an outline _______________ to the shape of your body or other opaque objects that are present.

8. The size of a shadow depends on _______________.

9. The _______________ an object is to a light source, the _______________ the shadow.
10. Light coming from above an object creates a ________________ shadow.

11. Light coming from the side of an object creates a ________________ shadow.

12. Sundials tell ________________ according to the position of the dial’s ________________ .

13. Earth rotates on its axis, and the Sun moves across the sky.
   The Sun casts its ________________ shadow at noon when it would be directly overhead in the sky. Its longest shadows would occur at ________________ and ________________ .

What are transparent and translucent materials?

14. Most light passes through ________________ materials because they do not ________________ or ________________ much light energy.

15. Translucent materials do let some light energy pass through them, but they also ________________ some light energy. ________________ is translucent.

Summarize the Main Idea

16. Briefly explain how different materials affect light.

__________________________

__________________________

__________________________

__________________________
Shadows

Use the descriptions listed below to find the right word and fill in the puzzle.

Across
1. The darker area that forms when an opaque object blocks light energy __________
2. Materials such as glass windowpanes that do not absorb or reflect much of the light energy so that most light passes through __________

Down
3. The imaginary line through the center of Earth on which Earth spins __________
4. Materials such as a dog or a brick wall that block the movement of light energy and allow a shadow to form __________
Shadows

Fill in the blanks.

Different materials affect light energy differently. Shadows are ___________ that form when an ___________ object blocks the movement of light energy. All opaque materials cast ______________. Shadows form on the side of an object facing ______________ from the light source. The closer an object is to a light source, the ______________ the shadow. The Sun casts its shortest shadow when it is directly overhead, which would be ______________. The longest shadows occur at ______________ and ______________. If you and a friend stand outside in the sunshine, your bodies would block the sunlight. Your friend would not be able to see through your body because bodies are opaque. However, you could see through ______________ materials such as glass because they do not absorb or ______________ much of the light energy.
Using Lasers

Write About It

Write a paragraph about another way that lasers are used to help people. Organize the steps in time order, from first to last. Use information from the chapter and from online resources.

Getting Ideas

Do some print and online research. Find five ways we use lasers to help us. Write them on a separate sheet of paper.

Planning and Organizing

Gloria wants to write about using a laser level to hang two pictures. Here are some steps that she wrote. Write 1 by the step that should come first. Number the last step 4.

A. Next, have a friend use a pencil to mark two points along the line. These points show where to hang your pictures. _____

B. Push the “on” button. This shoots a laser beam to the opposite wall. _____

C. First, decide how high you want the pictures to be. Place the laser level at this height at one corner of the wall. _____

D. Finally, attach two picture hangers to the wall at these points. Hang your pictures. _____

Now think about the object you chose. Write five steps showing how to use it.
Drafting

Here are two sentences Gloria wrote to begin her paragraph. Circle the one she should use.

We use lasers in many different ways.
A laser level can help you solve a simple, everyday problem.

Write a topic sentence for your paragraph.

Now write your paragraph on a separate piece of paper. Begin with a topic sentence. Write the steps in time order.

Revising and Proofreading

Proofread these sentences that Gloria wrote. Find five errors and correct them.

Have you ever tried to hang too pictures side-by-side. No matter how hard you try, one picture is usually higher than the other. A laser level can help you solve this problem. It is easy to use and it doesn’t cost a lot of money.

Now revise and proofread your paragraph. Ask yourself:

• Did I begin with a topic sentence?
• Did I put the steps in time order?
• Did I use sequence words such as first, next, and finally?
• Did I correct all grammar errors?
• Did I correct all spelling, punctuation, and capitalization errors?
Light

Choose the letter of the best answer.

1. The part of the eye that focuses incoming light is the
   a. clear outer covering.  
   b. iris.  
   c. lens.  
   d. pupil.

2. When white light strikes an object, some colors of light are
   a. absorbed.  
   b. bright.  
   c. destroyed.  
   d. directed.

3. These materials do not absorb or reflect much of the light energy.
   a. corneas  
   b. translucent  
   c. opaque  
   d. transparent

4. The colored circle that surrounds the pupil is the
   a. cornea.  
   b. direction.  
   c. iris.  
   d. lens.

5. Materials that absorb some light energy and let some light energy pass through are
   a. absorbed.  
   b. shadows.  
   c. translucent.  
   d. transparent.

6. The light that bounces off an object is called a(n)
   a. invisible light.  
   b. mirror.  
   c. path.  
   d. reflection.
Choose the letter of the best answer.

7. Light is another form of energy transferred by
   a. currents.  
   b. direction.  
   c. reflection.  
   d. waves.

8. Materials that absorb some of the light energy are
   a. blocked.  
   b. clear.  
   c. opaque.  
   d. transparent.

9. When light energy is blocked, this forms
   a. an image.  
   b. a reflection.  
   c. a shape.  
   d. a shadow.

10. The clear outer covering of the eye is the
    a. cornea.  
    b. eyelid.  
    c. object.  
    d. pupil.

11. An opening into the eye is the
    a. cornea.  
    b. iris.  
    c. pupil.  
    d. reflection.