VOCABULARY...

Everyday Living Words
History and Geography Words
Media and Marketplace Words
Music, Art, and Literature Words
Science and Technology Words
Workplace and Career Words

SCIENCE AND TECHNOLOGY WORDS

- Science in the News
- Computers and the Net
- The Natural World
- Observations and Experiments
VOCABULARY

SCIENCE AND TECHNOLOGY WORDS

♦ Science in the News  ♦ The Natural World
♦ Computers and the Net  ♦ Observations and Experiments

ELLIOFT QUINLEY
EVERYDAY LIVING WORDS
HISTORY AND GEOGRAPHY WORDS
MEDIA AND MARKETPLACE WORDS
MUSIC, ART, AND LITERATURE WORDS
SCIENCE AND TECHNOLOGY WORDS
WORKPLACE AND CAREER WORDS
 CONTENTS

▼ Introduction .......................... 4

UNIT 1 Preview .......................... 5

1 Unit 1 Glossary ...................... 6
2 How Does Sunlight Produce Vitamin D? ........... 9
4 Some Surprising Facts About Bones ................... 15
5 Science in the News: A Very Long-Term Experiment .... 18
6 Have You Ever Seen a Sun Dog? ....................... 21
7 Science in the News: The Dangers of Mercury .......... 24
▼ Unit 1 Review .......................... 27

UNIT 2 Preview .......................... 30

1 Unit 2 Glossary ...................... 31
2 What’s a Hertz? ....................... 34
3 What Causes Precipitation? ....................... 37
4 Try It Yourself: Make a Standing Wave ................. 40
5 Carbon: A Common Element ...................... 43
6 In Pursuit of Knowledge: The Scientific Method .... 46
7 Science in the News: Rewriting the Record Books ........ 49
▼ Unit 2 Review .......................... 52

UNIT 3 Preview .......................... 55

1 Unit 3 Glossary ........................ 56
2 Today’s Weather Forecast: A National Overview ........ 59
3 Try It Yourself: Making Mold ....................... 62
4 Two Kinds of Research: Basic and Applied .......... 65
5 How Does a Radio Work? .. 68
6 The Amazing Rhino ...................... 71
7 Science in the News: Avoiding Potholes on the Information Highway .... 74
▼ Unit 3 Review .......................... 77

UNIT 4 Preview .......................... 80

1 Unit 4 Glossary ...................... 81
2 Rabbits and Hares: What’s the Difference? .............. 84
3 Animal Intelligence ...................... 87
4 Why Are Deserts Dry? ..................... 90
5 Q&A Sites on the Internet ..................... 93
6 Science in the News: Monitoring Vesuvius .......... 96
7 Noise Pollution: How Loud Is Too Loud? ............... 99
▼ Unit 4 Review .......................... 102

▼ End-of-Book Test ..................... 105

▼ Word List ............................. 109
Welcome to VOCABULARY IN CONTEXT!

A well-developed vocabulary pays off in many important ways. Better-than-average “word power” makes it easier to understand everything you read and hear—from textbook assignments to TV news reports or instructions on how to repair a bicycle. And word power obviously increases your effectiveness as a communicator. Think about it: *As far as other people are concerned, your ideas are only as convincing as the words you use to express them.* In other words, the vocabulary you use when you speak or write always significantly adds to or detracts from what you have to say.

VOCABULARY IN CONTEXT was written especially for you. The program was designed to enrich your personal “word bank” with many hundreds of high-frequency and challenging words. There are six thematic books in the series—Everyday Living, Workplace and Careers, Science and Technology, Media and Marketplace, History and Geography, and Music, Art, and Literature. Each worktext presents topic-related readings with key terms in context. Follow-up exercises provide a wide variety of practice activities to help you unlock the meanings of unfamiliar words. These strategies include the study of synonyms and antonyms; grammatical word forms; word roots, prefixes, and suffixes; connotations; and the efficient use of a dictionary and thesaurus. Thinking skills, such as drawing conclusions and completing analogies, are included as reinforcement.

A word of advice: Don’t stop “thinking about words” when you finish this program. A first-class vocabulary must be constantly renewed! In order to earn a reputation as a first-rate communicator, you must incorporate the new words you learn into your everyday speech and writing.
Here’s an introduction to the vocabulary terms, skills, and concepts you will study in this unit. Answers are upside down on the bottom of the page.

Write T or F to show whether each statement is true or false.

1. _____ The words *molecule* and *atom* are **synonyms**.
2. _____ *Hexagon* is the **noun form** of *hexagonal*.
3. _____ *Cirrus* clouds are dark and dense.
4. _____ *Botanists* are scientists who study a type of food poisoning called *botulism*.
5. _____ The words *pollute* and *sterilize* are **antonyms**.
6. _____ The **prefix** -al turns the word *digit* into *digital*.
7. _____ The Greek root *therm* means “heat.”
8. _____ *Dynamic* is the **adjective form** of the noun *dynamics*.
9. _____ The **plural form** of *bacterium* is *bacteriums*.
10. _____ The **suffix** -ion can be used to turn a verb into a noun.

**SPELLING**

Circle the correctly spelled word in each group.

1. vertabrate virtabrate vertebrate
2. professor proffessor perfesser
3. germanate germinate gernenate
A glossary is an alphabetical list of unusual or specialized words from a certain field of knowledge. Following are some important scientific and technical words that all educated people should know.

atmosphere the air (made of gases, fine dust, and water vapor) that surrounds the Earth
atoms tiny parts into which all things on Earth can be broken down
bacteria simple, one-celled organisms that are visible only through a microscope
bit the smallest unit of information used by a computer; represented by a 0 or a 1
byte a string of eight bits standing for a single character
carbohydrates sugars and starches in food that give people energy
chemistry the scientific study of what substances are made of and how they can change when combined with other substances
climate a region’s average weather over many years
crust the outer layer of the Earth
diskettes disks made of magnetic material and used to store data entered into a computer
ecology the study of how all living things depend on one another
erosion the wearing away of soil by wind and water
evolution changes in a species over time
food chain a group of organisms, each of which is dependent on another for food
fossils the remains of organisms that lived long ago
organisms living things

WORDS IN CONTEXT
Complete each sentence with a word from the glossary. Use the other words in the sentence to help you decide which word to add. Check the dictionary definition if you’re still not sure.

1. The devastating Dust Bowl of the 1930s was caused by the widespread ________________ of America’s farmland.
2. Life science is the study of all the ____________________ on Earth.

3. Fruits, vegetables, and grains are all good sources of ____________________.

4. Some ____________________ are useful for making foods such as cheese; other kinds can cause sickness and death.

5. There are two hydrogen ____________________ and one oxygen ____________________ in a water molecule.

6. Each ____________________ of information in a computer program stands for a letter, number, or symbol.

SCRAMBLED WORDS

First unscramble the words from the glossary.
Then solve the crossword puzzle with words that complete the sentences.

ALCTIME ____________________
ODFO ACHIN ____________________
COYLOGE ____________________
MYSTERCHI ____________________
STRUC ____________________
HERPOSTMAE ____________________

ACROSS
5. _____ is the study of what matter is made of and how it can change.

6. The continents and the ocean floor are part of the Earth’s _____.

DOWN
1. The _____ extends more than 1,400 miles above the Earth’s surface.

2. Each of the organisms in a _____ (two words) eats one of the other organisms.

3. The study of the relationship between different populations in a habitat is called _____.

4. A desert _____ is mostly hot and dry.
WORD FORMS
Add vowels (a, e, i, o, u) to complete a different form of a glossary word. Use context clues for help. The first one has been done for you.

1. A b a c t e r i a l infection can usually be treated with an antibiotic.
2. As weather r o d s rocks, salt from the rocks enters the soil.
3. t m c energy is used to power some submarines.
4. Ch m s t s often conduct their experiments in laboratories.
5. Over time, organisms will f s l z if all the conditions are right.
6. All of today’s plants and animals v l d from tiny one-celled creatures.
7. Scientists call lightning an “t m s p h r c disturbance.”

EXAMPLES
Circle an example of each boldface glossary item.

1. climate
   mountainous overpopulated humid prosperous

2. carbohydrates
   lettuce butter proteins potatoes

3. organisms
   fleas glaciers chemicals instruments
Vitamin D is a chemical that allows your body to make use of an important nutrient called calcium. Our bodies make the Vitamin D we need by “doing chemistry.”

Sunlight is a part of the chemical reaction that makes Vitamin D. When it’s in your skin, the ultraviolet energy in sunshine snips up another chemical that is already floating around in your body. The new chemical formed is called Vitamin D3. But your body can’t make use of Vitamin D3 until a few more chemical reactions occur. So the D3 is carried to your liver, where the atoms are rearranged to form a new molecule. Then that chemical ends up in your kidneys. There it is taken apart again and put back together as calcitrol. This is the Vitamin D your stomach needs to absorb calcium.

Vitamin D is essential to everyone’s nutrition. It helps young people grow strong teeth and straight new bones. It keeps older people’s bones from getting brittle. Years ago, parents were concerned about the lack of sunshine in the dark winter months. They worried that their children weren’t getting enough Vitamin D. Today, Vitamin D is added to almost all milk that’s sold in the United States.
WORD ROOTS

• The Latin roots *vit* and *viv* mean “life.” The word *vitamin*, for example, means “a substance needed by the body for normal growth and health.” Read the list of words containing *vit* or *viv*. Then write a letter to match each word with its meaning. Use a dictionary if you need help.

1. ____ *survive*  
a. clear; bright; strong
2. ____ *vital*  
b. lively, spirited, energetic
3. ____ *vivid*  
c. to continue to live or exist
4. ____ *vivacious*  
d. necessary to life
5. ____ *revival*  
e. act of bringing back to life

• Now write sentences of your own, using the five boldface words above.

1. ________________________________________________________________
2. ________________________________________________________________
3. ________________________________________________________________
4. ________________________________________________________________
5. ________________________________________________________________

ANALOGIES

An *analogy* is a statement of relationship. It points out a likeness between things that are otherwise unalike. Complete the following analogies with words from the reading.

1. *Biology* is to *biologist* as ____ is to *chemist*.
2. *Adjust* is to *readjust* as *action* is to ____.
3. *Athlete* is to *athletic* as ____ is to *energetic*.
4. *Multiply* is to *multiplication* as ____ is to *rearrangement*.
RHYMING WORDS
Write words from the reading that rhyme with the words below.

FIRST PARAGRAPH:
1. plead ______________________
2. fizz ________________________
3. shore _______________________
4. break _______________________ 

SECOND PARAGRAPH:
1. voting ______________________
2. heart _______________________ 
3. drowned ____________________
4. buried ______________________

THIRD PARAGRAPH:
1. strung ______________________
2. plate _______________________ 
3. fluff _______________________ 
4. leaps _______________________

SYNONYMS
Complete the puzzle with words from the reading. Clue words are synonyms (words with a similar meaning) of the answer words.

ACROSS
3. permits
5. offspring
6. created
7. named

DOWN
1. requires
2. important
4. happen
All four terms refer to the conditions of a large body of water’s surface. The generic term wave refers to the undulations of the water’s surface. In their graceful rise and fall, waves are a combination of sea and swell.

Swell results from the wind’s past action on the water. It has a gentler, more rolling action than that of a wave. You can see swells in the open water even when the current wind is calm. The distance between successive crests is called the wavelength.

Sea refers to the distinct features of the wave—such as crests—caused by wind blowing across the water’s surface.

Surf is the interaction of the waves and the shoreline. It is influenced by the height and energy of the waves. The topography of the coast also affects surf. A beach with a gentle, offshore slope, for example, will have small surf. A beach that drops off sharply will have larger surf.

WORD SEARCH

1. What ten-letter noun in the reading means “the surface features of a region, including hills, rivers, roads, etc.”?

2. What ten-letter adjective in the reading means “going in regular order without a break”?

\[
E \quad \text{S}
\]
WORDS AND MEANINGS

Use the clues to help you solve the crossword puzzle. Answers are words from the reading.

ACROSS

2. colorless liquid found in oceans
5. points toward; assigns meaning to
7. tops or summits of waves
8. has an effect on

DOWN

1. the outside of something
3. words or phrases with special meanings in science, art, etc.
4. describes smooth, beautiful ease of movement
6. qualities or characteristics

PREFIXES

• The prefix *inter-* means “between,” and the prefix *off-* means “away from.” Write a word from the reading that begins with each prefix.

1. _______________________________ _______________________________

• Now replace each scrambled word in the sentences below with a new word that begins with *inter-* or *off-.* The first one has been done for you.

2. Tom said the tree house is MILSTI __________________ off-limits until he repairs the floor.

3. That science fiction story is about TALCGAIC __________________ warfare in outer space.

4. The actor waited GATES __________________ until he heard his cue.

5. Route 66 is a well-known ETAST __________________ highway.
COMMONLY CONFUSED WORDS

You read that the surface features of the coast affect surf. Are you clear about the difference between the words effect and affect?

**effect:** the consequence or result of an action  
**EXAMPLE:** The moon has an effect on the tides.

**affect:** to influence or produce an effect upon  
**EXAMPLE:** Bright lights affect the eyes.

Write affect or effect to complete each sentence.

1. The store owner hoped his advertisement would have a good __________________ on sales.

2. Our assignment was to write a paragraph about one cause and one __________________ of world hunger.

3. Why should you allow her bad mood to __________________ the way you feel?

4. If he studies a little harder, he can __________________ a big change in his grades.

COMPOUND WORDS

1. What compound word (one word made by combining two or more words) is a synonym of the word “beach”? ____________________________

2. The distance between cresting waves is named by what compound word? _____________________________

WORD COMPLETION

Add vowels (a, e, i, o, u) to complete the words from the reading.

1. __n_d__l__t__ __ns  are curvy, wavy motions.

2. W__v__s  are a combination of  s__ __ and  sw__ll.

3. Surf is influenced by the  h__ __g_h__t  and  __n_r_g_y  of the waves.
### Some Surprising Facts About Bones

Living cells make up less than five percent of your body’s bones—but they are continually busy! At this very moment, specialized cells in your skeleton are chewing up old, worn-out bits of bone and putting fresh new material in their place.

Meanwhile, these same busy bones are turning out new blood cells. And they’re making sure that every part of your body gets just the right amount of calcium to keep it going. How do your bones do this? They act as a storage bank for calcium. In fact, 99 percent of the calcium in your body is held in bone—ready for release into the bloodstream as needed.

Many people think of the skeleton as a symbol of death. But each and every bone is a living organ, full of dynamic vitality. In fact, every square inch of your skeleton is regenerated every ten years. Some parts—the spongy bones of the spine and hip—renew themselves much more often.

In a broader sense, human bone is a key to understanding who we are as a species. The bones of long-dead creatures that have turned to fossils tell us much about life. Without them, scientists would know very little about the history of vertebrates over the past 600 million years.

### WORD SEARCH

1. What seven-letter noun in the reading means “a group of plants or animals that are alike in certain ways”?  
   **s**

2. What seven-letter adjective in the reading means “active, energetic, vigorous”?  
   **d**

3. What seven-letter noun in the reading describes the hardened remains of ancient plants or animals?  
   **f**
SYNONYMS
First unscramble the words from the reading. Then write each unscrambled word next to its synonym (word with a similar meaning).

<table>
<thead>
<tr>
<th>SELS</th>
<th>OMANUT</th>
<th>ADED</th>
<th>TRUERACES</th>
<th>SYBU</th>
<th>NETFO</th>
<th>RAPT</th>
<th>LIARMEAT</th>
</tr>
</thead>
<tbody>
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<td>SELS</td>
<td>OMANUT</td>
<td>ADED</td>
<td>TRUERACES</td>
<td>SYBU</td>
<td>NETFO</td>
<td>RAPT</td>
<td>LIARMEAT</td>
</tr>
</tbody>
</table>

1. piece ______________________ 5. deceased ______________________
2. quantity ___________________ 6. frequently ______________________
3. fewer ______________________ 7. industrious _____________________
4. beings _____________________ 8. substance ______________________

SENTENCE COMPLETION
Puzzle answers are words from the reading that complete the sentences.

ACROSS
1. Every bone is a _____ organ.
5. A skeleton is often thought to be a ____ of death.
6. Every bone is full of dynamic _____.
7. Worn-out bits of bone are soon replaced with _____ new material.

DOWN
1. Fossils are the remains of _____ dead creatures.
2. Fossils tell us about the history of _____.
3. The bones of the spine and hip have a _____ texture.
4. Bones release _____ into the bloodstream.
MULTIPLE-MEANING WORDS

Some words have entirely different meanings when they’re used in different contexts. Find a word in the reading that matches each pair of definitions below. Write the words on the lines.

1. _____________________ • the basic unit of living matter (noun) • small room in a jail or prison (noun)
2. _____________________ • correct or true (adjective) • opposite direction of left (noun)
3. _____________________ • metal device that unlocks a door (noun) • important or central idea (adjective)
4. _____________________ • to play a part in a show (verb) • to function or do (verb)

UNDERSTANDING THE READING

1. What percentage of human bone is not made up of living cells? _________________

2. Bones hold our bodies upright and protect our inner organs. Describe two more jobs that bones do.

3. Are the bones in a 40-year-old the same bones that were there when that person was 25 years old? Explain why or why not.

GREEK ROOTS

The Greek root *gen* means “birth.” Draw a line to match each word on the left with its meaning on the right. Check a dictionary if you’re not sure!

1. **generation** a. children or offspring
2. **genealogy** b. to renew or give new life to
3. **regenerate** c. all the people born about the same time
4. **progeny** d. a family tree or list of ancestors
Seeds buried by a botanist 121 years ago have recently bloomed into bright yellow flowers.

In the late 1800s, William Beal was a botany professor at Michigan State University. In 1879, he devised an experiment to determine how long seed would continue to germinate. To do this he put seeds of mullein plants in 20 glass bottles and then buried them on the campus.

Professor Beal directed that one bottle should be unearthed every five years. To extend the experiment, the intervals were lengthened to every ten and then every 20 years.

The fifteenth bottle was dug up on an April day in the year 2000. The 1,050 seeds in the bottle were set out in a growth chamber. Twenty-five seedlings, nearly all of them mullein, began to grow.

Put in greenhouses, the plants soon started blooming. The bright yellow flowers were described as “beautiful” by botanists following through with Professor Beal’s experiment.

Five of William Beal’s bottles still remain buried on the Michigan State campus. The next one is scheduled to be dug up in 2020.

**WORD SEARCH**

1. What nine-letter noun means “a college or university teacher of the highest rank”?  
   ____________  

2. What eleven-letter compound word in the reading means “glass buildings that can be heated for growing plants”?  
   ____________  

3. What ten-letter noun in the reading means “a test to find out whether a theory is correct”?  
   ____________
ANTONYMS

Use words from the reading to solve the crossword puzzle. Clue words are *antonyms* (words that mean the opposite) of the answer words.

**ACROSS**

2. unearthed  
4. wither  
5. terminate  
6. earlier

**DOWN**

1. pale; dull  
3. long  

SYNONYMS

First unscramble the words from the reading. Then write each word next to its *synonym* (word with a similar meaning).

<table>
<thead>
<tr>
<th>DISCBREED</th>
<th>RINWOLFEK</th>
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<tbody>
<tr>
<td>NEATIMERG</td>
<td>NEXTED</td>
</tr>
<tr>
<td>CRIEDEDT</td>
<td>EDSIVED</td>
</tr>
</tbody>
</table>

1. blooming  
2. invented  
3. sprout  
4. ordered  
5. lengthen  
6. characterized

THINKING ABOUT THE READING

1. How many of the 1,050 seeds planted in the year 2000 did *not* grow? __________________

2. What’s the name of the branch of science that studies plants and how they grow? __________________

3. How many glass bottles of seeds have *already* been dug up? __________________
SUFFIXES MEANING “one who”

In the reading, the suffix -ist changes the word *botany* (the science of plants) into *botanist*—one who practices botany. But many other suffixes are also used to show “one who does, practices, or works with” something. Complete the sentences with words that contain the suffixes in the box. Check a dictionary if you need help. The first one has been done for you.

<table>
<thead>
<tr>
<th>-ist</th>
<th>-ian</th>
<th>-ant</th>
<th>-or</th>
<th>-er</th>
<th>-ar</th>
<th>-ent</th>
</tr>
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</tr>
</tbody>
</table>

1. An ______ artist ________ practices art.
2. A _________________________ is one who paints.
3. One who assists is an _________________________.
4. One who begs is a _________________________.
5. An _________________________ is one who edits.
6. One who resides is a _________________________.
7. One who practices magic is a _________________________.
8. An _________________________ is one who acts.

ANALOGIES

*Analogy* is a statement of relationship. To come up with the missing word, you must figure out the relationship between the first two words. Then complete each analogy with a word from the reading.

1. *Baby* is to *child* as *seed* is to ____________.
2. *Sweet* is to *taste* as *__________* is to *color*.
3. *Disappear* is to *vanish* as *__________* is to *stay*.
4. *Hours* are to *minutes* as *__________* are to *months*.
5. *__________* is to *bottle* as *tin* is to *can*.
6. *Run* is to *ran* as *dig* is to *__________*.
7. *Water* is to *fish* as *soil* is to ____________.
Lesson 6

Have You Ever Seen a Sun Dog?

If you glance up at the sun about an hour before sundown or after dawn, you might see a sun dog. Sun dogs are little patches of rainbow color that appear on the left and right sides of the sun.

Scientists say this is the effect of sunlight refracting as it passes through ice crystals. Sometimes these same crystals—which are in high-level cirrus clouds—can also create complete rainbow-like halos around the sun.

How are sun dogs created? The ice crystals in the clouds are of different shapes. One type, shaped like a six-sided plate, will reflect light only to the sides of the sun when it is oriented horizontally. When these hexagonal crystals are oriented in all different directions, a complete halo results.

The technical name for sun dogs—which are also called “false suns”—is parhelia. For a graphic that further explains this phenomenon, ask a reference librarian or surf the Web.

WORD SEARCH

1. What six-letter adjective in the reading describes clouds that are “feathery and wispy”? 
   
2. What four-letter noun in the reading names a unit of time?

3. What seven-letter noun in the reading means “a picture, map, or diagram”?

UNIT 1

SCIENCE AND TECHNOLOGY WORDS

SUN DOG

HORIZON
SYNONYMS

Complete the puzzle with words from the reading. Clue words are synonyms (words with a similar meaning) of the answer words.

ACROSS

2. spots
5. kind
6. look
7. six-sided

DOWN

1. forms
3. total
4. daybreak

LOOK IT UP!

Write the dictionary definition of each word from the reading.

1. phenomenon ________________________________________________________________

2. refracting ________________________________________________________________

3. reflect ________________________________________________________________

DIRECTIONAL RELATIONSHIPS

The word *horizontal* means “level, flat, parallel to the horizon.” The word *vertical* means “straight up and down; perpendicular to the horizon.” Write H or V to show whether each item below is horizontal or vertical.

1. _____ the walls of a house
2. _____ the legs of a table
3. _____ a cupboard shelf
4. _____ a flagpole
5. _____ the surface of a pond
6. _____ a city sidewalk
MYSTERY WORDS
Unscramble the words from the reading that match the definitions.

1. NOTDEERI ______________________: positioned in a certain way
2. SCARTSLSY ______________________: regularly shaped pieces
   formed when many substances become solids
3. CHINCATEL ______________________: describes something used
   in a particular science, art, or profession

UNDERSTANDING THE READING
Write T or F to show whether each statement below is true or false.

1. _____ Sun dogs always appear just before or after it rains.
2. _____ You can use the Internet to find out more about sun dogs.
3. _____ Sun dogs appear only when there are stratus clouds in the sky.
4. _____ The name “false suns” is also used to describe sun dogs.

WORD FORMS
You can change the form of many words to make different parts of speech. The verb
excite, for example, can be changed to the adjective exciting, or the noun excitement.
Change the form of each boldface word from the reading according to the directions
below. The first one has been done for you.

1. cloud adjective form: __________ cloudy
2. ice adjective form: ________________________________
3. appear noun form: ________________________________
4. hexagonal noun form: ________________________________
5. complete noun form: ________________________________
6. reflect noun form: ________________________________
Lesson 7

Science in the News: The Dangers of Mercury

Does your family still have an old-fashioned mercury thermometer? These days, most people use the new digital thermometers. They measure temperature faster, and they’re a lot easier to read.

How can you get rid of your old thermometer? You can’t just dump it in the trash. That tiny drop of mercury inside can be very dangerous to human health. The half gram of mercury in one broken thermometer is enough to pollute 5 million gallons of water! That’s why a mercury thermometer should never be incinerated or buried in landfill. Instead, old thermometers should be taken to the nearest household hazardous waste site.

Mercury in the environment carries unique risks. It affects the brain, spinal cord, kidneys, and liver. In humans, elevated mercury levels can cause mental and physical retardation.

The U.S. Environmental Protection Agency (EPA) is working to reduce human exposure to mercury. In 1998, the American Hospital Association signed an agreement with the EPA to start eliminating mercury from hospitals and clinics. A number of states and cities have recently passed laws making the sale of mercury thermometers illegal.

WORD SEARCH

1. What seven-letter adjective in the reading means “displaying data numerically rather than physically”? _________________________

2. What 11-letter noun in the reading means “the conditions that surround a person, animal, or plant and affect its character and growth”? _________________________
3. What four-letter noun in the reading means “the basic unit of weight in the metric system: about \( \frac{1}{28} \) of an ounce”? _________________________

4. What eight-letter noun in the reading means “a place where garbage or rubbish is disposed of by being buried under a shallow layer of earth”? _________________________

**GREEK ROOTS**

- The Greek root *therm*, meaning “heat,” appears in a number of English words. Complete each sentence with a familiar English word containing this root. Add consonants to complete the words.

  1. __ __ e __ __ a __ underwear helps to hold in body heat.
  2. Taylor’s __ __ e __ __ o __ bottle keeps her vegetable soup hot until lunchtime.
  3. Bradley uses the __ __ e __ __ o __ __ a __ to turn the furnace on and off.
  4. If the __ __ e __ __ o __ __ e __ __ e __ reading is 100°, you have a fever.

- The Greek root *meter* means “measure.” Add consonants to complete the words containing this root.

  5. The __ i a __ e __ e __ of a circle is a straight line passing through its center.
  6. A unit of length called a __ e __ __ i __ __ e __ __ e __ is one one-hundredth of a meter.
  7. Because it measures atmospheric pressure, a __ a __ o __ e __ __ e __ is used to help forecast the weather.
  8. An aircraft’s __ __ i __ __ e __ __ e __ shows height above sea level.
ANTONYMS
Write a letter to match each boldface word from the reading with its antonym (word with the opposite meaning).

1. _____ incinerated  a. purify
2. _____ pollute  b. frozen
3. _____ elevated  c. beneficial
4. _____ dangerous  d. lowered

SYNONYMS
First unscramble the words from the reading. Then write each word next to its synonym (word with a similar meaning).

<table>
<thead>
<tr>
<th>MUPD</th>
<th>NUQUIE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHART</td>
<td>GALLILE</td>
</tr>
</tbody>
</table>

1. _______________: unlawful  3. _______________: rubbish
2. _______________: discard  4. _______________: unusual

SUFFIXES
What word form will correctly complete each phrase? Rewrite each boldface word, adding the correct suffix.

1. hazard __________________________ waste site
2. signed an agree __________________________
3. measure temperature fast __________________________
4. new digit __________________________ thermometers
Here’s your chance to show what you’ve learned in this unit!

**SENTENCE COMPLETION**

Write words you studied in Unit 1 to correctly complete the sentences.

1. ________________ such as un-, re-, and inter- are added to the beginnings of base words to change their meaning.

2. The suffix ________________ means “one who practices or does something.”

3. *Ecological* is the adjective form of the noun ________________.

4. The words *nourishment* and *nutrition* are ________________.

5. The word ________________ means “to influence or produce an effect.”

6. The Greek root ________________ means “birth.”

**ANALOGIES**

Remember that analogies are statements of relationship. Figure out the relationship between the first two words. Then show the same relationship by completing each analogy with a word you studied in Unit 1.

1. *Oak* is to *maple* as *stratus* is to ________________.

2. *Slender* is to *chubby* as ________________ is to *lazy*.

3. *Page* is to *chapter* as *bit* is to ________________.

4. *Horizontal* is to *horizontally* as ________________ is to *vertically*.

5. *Steak* is to *protein* as *pasta* is to ________________.

6. *Off-* is to “away from” as ________________ is to “between.”
HIDDEN WORDS PUZZLE

Find and circle the words in the puzzle. Words may go up, down, across, backward, or diagonally. Check off each word as you find it.

___ TOPOGRAPHY ___ FEATURES

___ EVOLUTION ___ ECOLOGY

___ DISKETTES ___ SURFACE

___ CHEMICAL ___ FOSSILS

___ VERTEBRATES ___ VITALITY

___ EXPERIMENT ___ CRYSTALS

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

Now use each word in a sentence of your own. Be sure that your sentence makes the word’s meaning clear.

1. crystals: ____________________________________________________________
   ________________________________________________________________

2. topography: _________________________________________________________
   ________________________________________________________________

3. experiment: _________________________________________________________
   ________________________________________________________________

4. features: __________________________________________________________
   ________________________________________________________________

5. vertebrates: _________________________________________________________
   ________________________________________________________________

6. vitality: __________________________________________________________
   ________________________________________________________________

7. evolution: _________________________________________________________
   ________________________________________________________________
8. ecology: ____________________________________________
   ____________________________________________

9. chemical: __________________________________________
   ____________________________________________

10. fossils: ____________________________________________
    ____________________________________________

11. diskettes: __________________________________________
    ____________________________________________

12. surface: ____________________________________________
    ____________________________________________

**COMPOUND WORDS**

Write the compound word from Unit 1 that answers the question or completes
the sentence.

1. A place where garbage is buried is called a ________________________.

2. In the wintertime, plants can be grown in a ________________________.

3. What is a synonym for dawn? ____________________________________

4. Sun dogs are little patches of ________________________ color around
   the sun.

5. Your bones release calcium into your ________________________.

6. What do we call the distance between successive crests of waves?
   ________________________

**MULTIPLE-MEANING WORDS**

Circle the word in each pair that can have an entirely different meaning when it’s
used in a different context.

1. crust   crunch
2. sell    cell
3. treated traded
4. big     bit
5. fractures features
6. swell   swollen
7. wave    surface
8. drink   drop
UNIT 2

SCIENCE AND TECHNOLOGY WORDS

Here’s an introduction to the vocabulary terms, concepts, and skills you will study in this unit. Answers are upside down on the bottom of the page.

WORD COMPLETION
Add vowels (a, e, i, o, u) to complete the words.

1. __x_t__nct animals are no longer living on the Earth.
2. C__rb__n is part of every living thing.
3. The verb form of observation is the word __b_s__rv__.
4. The bowhead whale is an __n_d__ng__r__d species.

TRUE OR FALSE
Write T or F to show whether each statement is true or false.

1. _____ Adding the suffix -al can change a noun to an adjective.
2. _____ The plural form of the word theory is theories.
3. _____ The words characteristics and properties are synonyms.
4. _____ The words disprove and verify are antonyms.
5. _____ Homonyms are synonyms that sound alike.
6. _____ The prefix kilo- means “one million.”
7. _____ A compound word is made up of two or more words.

ANSWERS: WORD COMPLETION: 1. extinct 2. carbon 3. observe 4. endangered
### Glossary

A *glossary* is an alphabetical list of unusual or specialized words from a certain field of knowledge. Following are some important words from the fields of science and technology.

- **cold-blooded** animals whose body temperature changes with the temperature of their environment
- **condensation** the process by which gas turns into a liquid
- **continents** the seven major land masses on Earth: Africa, Antarctica, Asia, Australia, Europe, North America, and South America
- **environment** all the conditions that surround a person, animal, or plant and affect its life
- **evaporation** the process by which heat changes water to water vapor
- **extinct** no longer living on Earth; used to describe a species that has died out
- **ozone** a form of oxygen in a thin layer within the stratosphere
- **precipitation** any moisture that falls from the atmosphere
- **respiration** the way a cell gets energy by mixing food and oxygen
- **satellite** an object that revolves around a planet
- **solar system** the sun and all the planets that revolve around it
- **warm-blooded** animals whose body temperature stays the same in hot and cold weather
- **water cycle** natural process by which water continually condenses, evaporates, and condenses again

### Words in Context

Use context clues (the other words in the sentence) to help you complete the sentences with words from the glossary. If you're not sure, check a dictionary.

1. The ________________ of Antarctica is in the Southern Hemisphere.

2. Fish and snakes are ________________ animals.
3. In 1957, the first manmade ___________________ circled the Earth.

4. Every living thing responds to changing conditions in its _________________.

5. The dinosaur and the woolly mammoth are examples of ________________ creatures.

6. Jupiter and Saturn are two planets in our ____________ ____________.

7. In humans, ___________________ begins when the lungs take in air.

8. Steam coming from a tea kettle is an example of _________________.

9. _________________ protects the Earth from harmful radiation from the sun.

10. _________________ occurs when water vapor turns into dew.

11. In a process called the ________________ _______________, all the water on Earth is used over and over again.

12. Squirrels, whales, and mice are all _________________ animals.

13. Rain is the most common form of _________________.

WORD FORMS
To correctly complete each sentence, rewrite each boldface word in a different form.

1. (evaporation) On a sunny day, water in a puddle will ________________ quickly.

2. (extinct) Mass ________________ occurs when many forms of life suddenly disappear from the Earth.

3. (environment) ________________ are those who work to protect Earth’s air and water from pollution.

4. (condensation) Freezing temperatures ________________ water into ice.

ANALOGIES
Remember that analogies are statements of relationship. Begin by thinking about the relationship between the first two words. Then complete the analogy by writing the glossary word that makes sense.

1. Human being is to frog as warm-blooded is to ________________.

2. Past is to present as ________________ is to living.

3. Daisy is to flower as sleet is to ________________.

4. Venus is to planet as moon is to ________________.

5. Environment is to environmental as continent is to ________________.

6. Circulation is to circulatory as ________________ is to respiratory.
Lesson 2

What’s a Hertz?

A hertz is the standard unit of frequency used to measure an energy wave. Suppose you were watching a child on a swing. Each cycle of swing-out and swing-in would be one cycle. If you kept track of time while you watched, you could measure the swing in hertz. Two in-and-out cycles per second would be 2-hertz or 2Hz.

Household electricity is usually 120 volts at 60Hz—which means it pulses energy at 60 times per second. Kilohertz means thousands of cycles per second. AM radio broadcasts in kHz. Its programs are transmitted on waves that number 740,000 per second. Megahertz or MHz means millions of cycles per second. Cordless phones broadcast as radio signals that cycle at millions of times a second. Computer processors run at speeds of about 450 million cycles per second.

Where did the word hertz come from? It came from a German physicist named Heinrich Hertz. In the late 1800s, he was the first to produce electromagnetic waves under laboratory conditions. This led to the development of the telegraph and the radio.

The abbreviations Hz, kHz, and MHz appear in tiny print on lots of appliances.

WORD SEARCH

1. What six-letter noun in the reading means “the power of certain forces of nature to do work”?  ______________________

2. What nine-letter noun in the reading means “a device for sending messages by a code of electrical signals”?  ______________________

3. What nine-letter noun in the reading means “a scientist who studies the interrelationships of matter, energy, force, and motion”?  ______________________
WORDS AND MEANINGS
Use the clues to help you solve the crossword puzzle.

ACROSS
4. any standard term of measurement such as inch, pound, or degree
5. things like refrigerators, toasters, hairdryers
6. to determine quantity
7. a complete set of events that repeat in the same order

DOWN
1. room or building where scientific tests are carried out
2. information sent by an electromagnetic wave
3. measurements of an electric current

PREFIXES
You learned in the reading that the prefix kilo- means “thousand” and the prefix mega- means “million.” Use this information to help you complete the following sentences.

1. The word kilometer must mean _________________ meters.
2. A _________________ must be equal to one million tons.
3. A _________________ must be one one-millionth of a megaton.
4. A megawatt of electrical power must be equal to one million ________________.
5. Something that weighs one kilogram must be equal to _________________ grams.
6. A megabyte must be equal to one million ________________ of computer memory.
ABBREVIATIONS

You already know that abbreviations—like Mr. for Mister—are shortened forms of words. On the lines below, write either the abbreviation or the whole word that matches. The first one has been done for you.

1. ___________ = MHz 5. gallon = ______________
2. hertz = ______________ 6. ______________ = min.
3. kilohertz = ______________ 7. ______________ = oz.
4. ______________ = ft. 8. quart = ______________

MULTIPLE-MEANING WORDS

Some words have entirely different meanings when they’re used in different contexts. Notice the **boldface** words in phrases from the reading. Then write a sentence of your own, using the same word with an entirely different meaning.

1. measure an energy **wave** __________________________________________
2. cycles per **second** _______________________________________________
3. if you kept **track** _______________________________________________

SYNONYMS

Draw a line to match each **boldface** word from the reading with its **synonym** (word with a similar meaning).

1. transmitted vibration
2. run power
3. pulse operate
4. energy sent
Numerous factors influence the amount of precipitation in a location. Three of the most important factors are a location’s latitude, distance from the ocean, and elevation. Compare the cities of Los Angeles, Denver, Seattle, and Phoenix, for example.

In the United States, most precipitation-producing weather systems come from the west. These systems are carried along by undulations in the polar jet stream. The jet stream is stronger in higher latitudes, bringing more storms to northern locales.

Western cities near the Pacific Ocean tend to get more precipitation than inland cities. Why? Because of the higher mountains. Ranges such as the Cascades, the Sierra Nevada, and the Rockies wring moisture out of the clouds as they are lifted over the mountains.

Finally, elevation determines whether precipitation will fall as rain or snow.

Average annual rainfall in the four cities is as follows: Los Angeles, 14.83 inches; Denver, 12.55 inches; Seattle, 37.92 inches; and Phoenix, 7.95 inches.

<table>
<thead>
<tr>
<th>City</th>
<th>Rainfall (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Los Angeles</td>
<td>14.83</td>
</tr>
<tr>
<td>Denver</td>
<td>12.55</td>
</tr>
<tr>
<td>Seattle</td>
<td>37.92</td>
</tr>
<tr>
<td>Phoenix</td>
<td>7.95</td>
</tr>
</tbody>
</table>

**WORD SEARCH**

1. What nine-letter noun in the reading means “height above sea level”?

2. What five-letter noun in the reading means “a row or line of connected mountains”?

3. What eight-letter noun in the reading means “the length of a line between two points”? 
ANTONYMS

Solve the crossword puzzle. Clues are antonyms (words with opposite meanings) of words from the reading.

ACROSS
3. insignificant
4. dropped
5. under
6. lower

DOWN
1. least
2. weaker
3. oceanfront

HOMOPHONES

Homophones are words that sound exactly alike but have different meanings and spellings. In the reading, for example, you can find the homophones weather and whether. Write a homophone for each word listed below.

1. aunt ________________________ 6. fowl ________________________
2. bare ________________________ 7. herd ________________________
3. capital ______________________ 8. higher ______________________
4. cent ________________________ 9. not _________________________
5. chews ________________________ 10. mane ______________________

LOOK IT UP!

Check a dictionary to help you compare the meanings of longitude and latitude. Circle the word that correctly completes the sentence.

1. A city’s (longitude / latitude) is its distance north or south of the equator.

2. Both longitude and latitude are measured in (miles / degrees).
3. (Longitude / Latitude) is distance measured east or west of an imaginary line running from the North Pole to the South Pole.

4. Lines of longitude and latitude are usually shown on a (globe / road map).

5. Chicago is at 87 degrees west (latitude / longitude).

6. Minneapolis is at 45 degrees north (latitude / longitude).

ANALOGIES

Analogies are statements of relationship. To complete an analogy, figure out the relationship between the first two words. Then write the word from the reading that shows the same relationship.

1. Horizontal is to vertical as latitude is to __________________________.

2. Numerous is to plentiful as yearly is to __________________________.

3. Warmer is to rain as colder is to __________________________.

4. Mountain is to mountainous as pole is to __________________________.

MYSTERY WORDS

Unscramble words from the reading to correctly complete the sentences.

1. SCARTOF ____________________ are causes that combine to bring about a result.

2. LAUDNUSNOIT ____________________ are wavy movements.

3. Precipitation is measured in CHINES ____________________.

4. Liquid causing dampness is called STROMUIE ____________________.
Any surfer will tell you that an ocean wave keeps moving—even when it washes onto a beach. This experiment will show you a kind of wave that doesn’t go anywhere. It’s called a **standing wave**.

To conduct this experiment, you’ll need:

- several drinking glasses of different sizes
- a small cloth such as a dish towel
- a plastic bottle of water
- a machine that shakes when it operates (clothes dryer, dishwasher, washing machine, air conditioner, etc.)

Follow these steps:

1. Fill one of the glasses about half full of water.
2. Put the cloth on the machine and place the glass on the cloth.
3. Turn on the machine and wait a few seconds.
4. Look at the water’s surface. Do you see a pattern of rings?
5. If you don’t see a pattern, repeat the experiment with a different size glass of water.
6. What should you do if you try all the glasses and still don’t see a pattern? Repeat the experiment with a different machine.

What will happen when you finally find the right combination of glass size and shaking machine? You will see ring-shaped standing waves on the water’s surface. The waves in the water will go from the wall of the glass to the center—and then seem to disappear. But the waves don’t **actually** disappear in the middle. As they keep going to the other side of the glass, they exactly match the waves coming toward them!

**WORD SEARCH**

1. Which five-letter noun in the reading means “one of the huge bodies of salt water on Earth”? __________________________
2. What seven-letter noun in the reading names a manmade substance used in manufacturing many products?  

3. What seven-letter adjective in the reading means “more than two but not many”?  

SYNONYMS

Complete the crossword puzzle with words from the reading. The clue words are synonyms (words with a similar meaning) of the answers.

ACROSS
3. to demonstrate  
6. to test

DOWN
1. middle  
2. vibrates  
4. type  
5. little

WORDS IN CONTEXT

First unscramble the word from the reading and write it on the line. Then circle a letter to show the word’s meaning.

1. The sea SEWSAH ______________ the shore.  
a. cleans with soap and water  
b. flows over or against  
c. wears or carries away

2. A NAGDINTS ______________ wave doesn’t go anywhere.  
a. confined; unable to flow freely  
b. upright or erect position  
c. position, rank, or reputation
3. An electric shaver is a machine that shakes when it 
APESTORE ________________.
   a. runs or         b. conducts          c. manages or
       works          surgery           controls

4. A RENTTAP ________________ of rings will appear on the 
   water’s surface.
   a. planned         b. guide for making    c. visible
       route           something           design

ANTONYMS
Write a letter to match each word from the reading with its antonym (word with the opposite meaning).

1. _____ full
   a. away
2. _____ different
   b. identical
3. _____ toward
   c. vanish
4. _____ appear
   d. empty
5. _____ exactly
   e. approximately

THE PREFIX dis-
The prefix dis- has three meanings: (1) away, away from, or out of; (2) the opposite of; (3) to fail, stop, or refuse to. Read the words listed below. Then write 1, 2, or 3 to show the meaning of the prefix in that word. If you’re not sure, check a dictionary.

1. _____ disbelief
   6. _____ disregard
2. _____ dislocate
   7. _____ dissatisfied
3. _____ disagree
   8. _____ disqualified
4. _____ dishonest
   9. _____ disown
5. _____ displace
   10. _____ disobey
All things that take up space on Earth—including solids, liquids, and gases—are made of matter. And all matter is made of chemical elements. So far, scientists have identified 103 elements. Some of these are gold, helium, tin, oxygen, and carbon. Elements are basic. That means they cannot be broken down into simpler substances.

Carbon is an interesting element. In nature, it is found in two different forms that have very different properties, or characteristics. A diamond is one form of carbon. As the hardest natural substance known, diamonds are used to make cutting tools. And, of course, polished diamonds are beautiful gems often used in jewelry. Another form of the same element is graphite—which is soft, black, and slippery. Because of its properties, graphite is used to grease the moving parts of some machines. Did you know that what we call the "lead" in a pencil is really graphite?

Carbon makes up less than one percent of all matter. But this important element can be found in all foods and is part of every living thing. Chemists have given the name organic chemistry to the branch of chemistry that studies carbon compounds.

WORD SEARCH

1. What ten-letter noun in the reading means “the characteristics or special qualities by which something is known”? p________________

2. What three different forms of matter are mentioned in the reading?
    s________________ l________________ g____________

3. What nine-letter noun in the reading means “chemical substances formed by combining two or more elements”? c________________
4. What seven-letter adjective in the reading means “having to do with chemical compounds containing carbon”? ________________

WORDS IN CONTEXT
Use words from the reading to complete the sentences.

1. Some of the ________________ of matter are color, odor, shape, and density.

2. The two gases mentioned in the reading are ________________ and ________________.

3. Platinum and silver are two ________________ that are often used in fine jewelry.

4. Chemists study ________________ and how it can change.

WORD FORMS
Complete the chart by writing either the noun or adjective form of each word given. The first one has been done for you.

<table>
<thead>
<tr>
<th>NOUN</th>
<th>ADJECTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>science</td>
<td>scientific</td>
</tr>
<tr>
<td>2.</td>
<td>chemical</td>
</tr>
<tr>
<td>3. beauty</td>
<td></td>
</tr>
<tr>
<td>4. difference</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>important</td>
</tr>
<tr>
<td>6. nature</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>elementary</td>
</tr>
</tbody>
</table>
WORDS AND MEANINGS

Use the clues to help you solve the crossword puzzle.

ACROSS

2. fundamental; not reducible
4. So far, 103 of them have been identified.
5. form of carbon that is soft and black
7. the hardest substance in nature

DOWN

1. form of matter including oxygen (plural)
2. a division or part of
3. form of matter including iron (plural)

SYNONYMS

Unscramble the words from the reading. Then write each word under its synonyms (words with a similar meaning).

TRIPEROPES ______________________ ROMF ______________________
DUMSCOONP _____________________ SEERAG ______________________

1. kind, type, ______________________
2. qualities, characteristics, ______________________
3. to oil, lubricate, ______________________
4. mixtures, combinations, ______________________
Science is the study of nature and the universe, based on facts learned from observation and experiment. This process of discovery is called the scientific method. There are five orderly steps in the scientific method:

1. **State the problem.** You can’t begin to answer a question or solve a problem until you know exactly what it is that you’re trying to learn.

2. **Gather all related information.** You must research your subject thoroughly to determine what is already known. Besides reading about the subject, you might talk to others who are working on the same problem.

3. **Suggest a possible answer or solution.** Scientists call this preliminary theory a hypothesis. For the time being, they use this idea as the basis for further study and reasoning.

4. **Conduct experiments to try out the theory.** A scientific experiment is a test—or series of tests—designed to determine whether a theory is correct. The results of one experiment often lead to further experiments.

5. **Record the results.** Lastly, a scientist writes a report on the experiment. This document, which is recorded in some detail, may be used as proof that the theory is correct.

**WORD SEARCH**

1. What eight-letter noun in the reading means “everything that exists, including the Earth, sun, planets, and outer space”?

2. What eight-letter noun from the reading means “a written record that proves something”?

3. What eleven-letter noun in the reading means “careful examination and study of something”?
4. What seven-letter noun in the reading means “something being discussed or examined”? ____________________

PARTS OF SPEECH

• Study the words in the box. Circle only the words that can be used as either a noun or a verb. Check a dictionary if you’re not sure. (Hint: You should circle 12 words.)

<table>
<thead>
<tr>
<th>problem</th>
<th>percent</th>
<th>study</th>
<th>subject</th>
<th>conduct</th>
</tr>
</thead>
<tbody>
<tr>
<td>document</td>
<td>solve</td>
<td>proof</td>
<td>time</td>
<td>test</td>
</tr>
<tr>
<td>experiment</td>
<td>state</td>
<td>learn</td>
<td>basis</td>
<td>reading</td>
</tr>
<tr>
<td>determine</td>
<td>observe</td>
<td>step</td>
<td>lead</td>
<td>results</td>
</tr>
</tbody>
</table>

• Now write sentences of your own. Use four of the words you just circled in two different ways.

1. NOUN: __________________________________________
   VERB: __________________________________________

2. NOUN: __________________________________________
   VERB: __________________________________________

3. NOUN: __________________________________________
   VERB: __________________________________________

4. NOUN: __________________________________________
   VERB: __________________________________________

PLURALS

Write the plural (names more than one) form of each word from the reading.

1. experiment ____________________ 3. proof ____________________
2. discovery ____________________ 4. theory ____________________
SYNONYMS
Use words from the reading to complete the crossword puzzle. Clue words are synonyms (words with a similar meaning) of the answer words.

ACROSS
5. test
6. comprehended
7. theory
8. collect

DOWN
1. additional
2. introductory
3. process
4. thinking

ANTONYMS
Unscramble the words from the reading. Then write each word next to its antonym (word with the opposite meaning).

1. haphazardly / ____________________
2. follow / ____________________
3. avoidance / ____________________
4. ignorance / ____________________
Until now, scientists thought that bowhead whales had a longevity of 80 to 100 years—about the same as humans. But that was before the Inupiat people of northern Alaska discovered evidence to the contrary. After recent hunts, they found six ancient ivory and stone harpoon points embedded in the blubber of four whales. How could that be? Native Alaskan whalers had used only steel harpoons since the 1800s!

Scientific researchers were amazed but skeptical. So, to determine ages, they studied the lenses of the whales’ eyes. Changes in amino acids revealed that three whales were between 135 and 172 years old. The fourth whale appeared to have been 211 when it was killed! These findings could establish whales as the longest-living mammals on Earth. Further tests on the bowheads’ bones and skin are being conducted to verify the initial estimates of age. If the results are confirmed, we will know that some whales that are alive today were swimming around the arctic seas during America’s Civil War—or perhaps even when Thomas Jefferson was president!

Bowhead whales—each weighing 80 to 110 tons and measuring 50 to 60 feet in length—bear distinguishing white markings on their front lower jaws. There are thought to be 8,000 to 12,000 bowheads in existence. The bowhead is listed as an endangered species.

**WORD SEARCH**

1. What nine-letter noun in the reading means “span of life”? l

2. What seven-letter noun in the reading names a kind of weapon? h

3. What seven-letter plural noun in the reading means “warm-blooded animals with backbones”? m
ANTONYMS

First unscramble the words from the reading. Then write each unscrambled word next to its antonym (word that means the opposite).

| THRENRON | NICETAN |
| FRONCDIME | MEAZDA |
| RIVF Ey | EROWL |

1. southern ________________ 4. disprove ________________
2. upper _________________ 5. modern ________________
3. unsurprised ___________ 6. denied ________________

WORDS IN CONTEXT

Circle a letter to show the meaning of the boldface word or words.

1. The bowhead’s jaw has a distinguishing white marking.
   a. elegant;   b. different in  c. conspicuous; dignified every whale distinct
2. The Inupiats discovered evidence to the contrary.
   a. that discredited b. that raised  c. stubbornly earlier evidence another issue inflexible

HOMOPHONES

Homophones are words that sound alike but have different meanings and often different spellings. Find a homophone in the reading for each word listed below. The first one has been done for you.

1. wails _______________________ 4. sees _______________________
2. forth _______________________ 5. inn _______________________
3. steal _______________________ 6. bare _______________________
SYNONYMS

Complete the crossword puzzle. Clues are synonyms (words with a similar meaning) of words from the story.

ACROSS

1. seemed
4. proof
6. doubtful
7. showed

DOWN

2. buried
3. first
4. certify
5. guesses

UNDERSTANDING THE READING

Write T or F to show whether each statement is true or false. Write NI if there is no information in the reading to suggest an answer.

1. _____ Until recently, some kinds of fish were thought to be the longest living animals.

2. _____ Scientists can estimate a whale’s age by studying citric acids in the lenses of its eyes.

3. _____ The Inupiat people have hunted whales for more than 4,000 years.

4. _____ Bowheads may be the oldest mammals on the planet.
Here’s your chance to show what you’ve learned in this unit.

**SENTENCE COMPLETION**

Circle the word that correctly completes each sentence.

1. A scientist who studies matter, energy, and force is called a (physician / physicist).

2. The words *synonym* and *antonym* are (adverbs / antonyms).

3. The letter groups *-ing, -ant*, and *-able* are common (suffixes / prefixes).

4. A city’s (elevation / latitude) is its height above sea level.

5. Scientists have identified 103 chemical (processes / elements).

6. (Properties / Characteristics) is a multiple-meaning word.

7. The words *seas* and *sees* are called (abbreviations / homonyms).

8. A (meteor / satellite) is an object that revolves around a planet.

9. The abbreviations kHz and MHz appear in tiny print on lots of (appliances / lightbulbs).

10. Lines of (latitude / longitude) show distance north or south of the equator.
HIDDEN WORDS PUZZLE

Find and circle the words in the puzzle. Words may go up, down, across, backward, or diagonally. Check off each word as you find it.

___ CONTINENTS ___ OCEANS
___ SYNONYM ___ ENERGY
___ HOMONYM ___ ANTONYM
___ ADJECTIVE ___ NOUN
___ ABBREVIATION ___ GAS
___ COMPOUND ___ RAIN

WORDS IN CONTEXT

Write original sentences, using the words from the hidden words puzzle. Include examples in each sentence.

1. continents ____________________________________________________________

2. oceans _______________________________________________________________

3. energy ________________________________________________________________

4. compound ____________________________________________________________

5. antonym ______________________________________________________________
6. **abbreviation** ______________________________________________________
   ______________________________________________________

7. **synonym** ______________________________________________________
   ______________________________________________________

8. **homonym** ______________________________________________________
   ______________________________________________________

9. **adjective** ______________________________________________________
   ______________________________________________________

10. **noun** __________________________________________________________
    ______________________________________________________

11. **gas** __________________________________________________________
    ______________________________________________________

12. **rain** __________________________________________________________
    ______________________________________________________

**ANALOGIES**

*Analogies* are statements of relationship. Figure out the relationship between the first two words. Then complete the analogy with a word you studied in this unit.

1. *Water* is to *ocean* as *land* is to __________.
2. *Cold* is to *condensation* as *warmth* is to __________.
3. *Rise* is to *evaporation* as *fall* is to __________.
4. *Abbreviation* is to *Mr.* as *kHz* is to __________.
5. *Extinct* is to *living* as *cold-blooded* is to __________.
6. *Weight* is to *pound* as *energy wave* is to __________.
Here’s an introduction to the vocabulary terms, skills, and concepts you will study in this unit. Answers appear upside down on the bottom of this page.

RECOGNIZING EXAMPLES
Circle two items in each word group that match the category.

1. **proper adjectives**
   - Joseph  Ouch!  Hispanic  Shakespearean

2. **plural nouns**
   - celebrates  frequencies  violates  fungi

3. **compound words**
   - broadcasting  interaction  ecosystem  snowflake

4. **words with a prefix**
   - researcher  unforgivable  disjointed  desired

5. **words with a suffix**
   - moldy  hairless  imprecise  nostrils

SPELLING
Underline the two correctly spelled words in each group.

1. inventor  modems  inventor  modams

2. navigate  rhinocerus  rhinoceros  navigate

3. appropriate  substitute  appropriate  substitute

4. studios  amplified  studios  amplified
A glossary is an alphabetical list of unusual or specialized words from a certain field of knowledge. Following are some important words from the fields of science and technology.

**appendage** a body part that sticks out, such as an arm, wing, or leg

**axis** an imaginary line running through the center of a planet from one pole to the other pole

**carbon dioxide** gas made of carbon and oxygen; it is breathed out of the lungs and taken in by plants

**chromosomes** tiny particles in the nucleus of cells made up of DNA and genes

**cyclone** an area of low pressure with strong, circular winds

**ecosystem** all the living things that make up a particular community in a certain environment

**fertilization** the joining of a sperm cell with an egg cell

**genetics** the study of the way animals and plants pass on characteristics to their offspring

**germination** the process by which a young plant breaks out of its seed

**magma** the molten matter under the Earth’s crust

**parasite** an organism that lives in or on another organism

**Precambrian era** the geological era that began 4.5 billion years ago and lasted nearly four billion years

**tissue** a group of cells that all do the same job

**WORDS IN CONTEXT**

Use context clues to help you complete the sentences with the correct words from the glossary. If you’re not sure, check a dictionary.

1. The ________________________ covers nearly 85 percent of all geological time.

2. Much like a tornado, a ________________________ can be very damaging.
3. A tree branch and a dog’s tail are both _________________.

4. When _________________ reaches a volcano’s surface, it is called lava.

5. If you’ve ever seen a flea on a dog, you’ve seen a _________________.

6. Every 24 hours, the Earth makes a complete rotation on its _________________.

7. The _________________ of a pond includes weeds, insects, frogs, worms, and fish.

8. If you exercise too hard, you may damage your muscle _________________.

9. _________________ is the branch of science that explains how traits are passed on from one generation to the next.

10. In order to make food, plants need _________________.

11. Humans have 23 pairs of _________________; fruit flies have only four pairs.

12. At _________________, a baby inherits genes from both its father and its mother.

13. Sprouts in a vegetable garden show that _________________ has taken place.

SCRAMBLED WORDS
Unscramble the words from the reading to complete the sentences.

1. YOGLOGE _________________ is the study of the Earth’s crust, including rocks and fossils.

2. RUCLARIC _________________ winds blow around in a spiral.
WORDS AND MEANINGS

Use clues to help you complete the crossword puzzle. Answers are words from the reading.

ACROSS

1. male reproductive cell
3. broken off part or piece of something
7. a thousand million

DOWN

2. a tiny bit; a speck
4. form of matter that is neither liquid nor solid
5. female reproductive cell
6. kind of dioxide formed with oxygen

SUFFIXES

Suffixes can be used to turn many words into adjectives (describing words). Rewrite the words below. Make them adjectives by adding one of these suffixes: -y, -ic, -al, or -ful.

1. dream ___________________ 5. history ________________________
2. music ____________________ 6. guilt __________________________
3. peace ____________________ 7. atmosphere __________________
4. ice ______________________ 8. environment __________________
People in the northern Midwest can expect frigid temperatures today. In some extreme northern locations, 0 degrees may be the daytime high. The South will be fairly chilly as well. Highs there are projected to be in the upper 40s and lower 50s. As a group of high-pressure systems move across the country, temperatures are expected to fall even lower.

Snow will continue to fall across the Midwest. The South will see a few more flurries and showers before this evening. But most of the precipitation there will dissipate by tomorrow morning. Both the Pacific Northwest and the Northeast can expect more rain today as low-pressure systems linger. But the relentless weather pattern in both regions is expected to break up by the weekend.

**TODAY’S OUTLOOK IN SELECTED CITIES**

<table>
<thead>
<tr>
<th>CITY</th>
<th>Forecast Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATLANTA</td>
<td>Rain showers changing to ice and snow; increasing clouds; high 45°, low 28°</td>
</tr>
<tr>
<td>SEATTLE</td>
<td>Intermittent showers until noon, then mostly sunny; high 45°, low 39°</td>
</tr>
<tr>
<td>KANSAS CITY</td>
<td>Overcast in the morning, sunny in the afternoon; high 30°, low 10°</td>
</tr>
<tr>
<td>DETROIT</td>
<td>Consistent light flurries throughout the day; high 25°, low 5°</td>
</tr>
</tbody>
</table>

**WORD SEARCH**

1. What twelve-letter adjective in the reading means “stopping and starting again from time to time”?  
   
   __________
2. What eight-letter plural noun in the reading means “sudden light falls of snow or rain”? 
   ____________________________

3. What eight-letter noun in the reading is a synonym of “prediction”? 
   ____________________________

4. What four regions of the United States are mentioned in the reading?
   ____________________________  ____________________________
   ____________________________  ____________________________

PARTS OF SPEECH

Many words can be used as either a noun (names a person, place, or thing) or a verb (names an action). On the lines below, write two sentences using the boldface word from the reading. In one sentence, use the word as a noun. In the other, use the word as a verb. The first one has been done for you.

1. snow  **noun:** Freshly fallen snow covered the sidewalk. 
   **verb:** The weather forecaster said it might snow today.

2. fall  **noun:** ____________________________
   **verb:** ____________________________

3. rain  **noun:** ____________________________
   **verb:** ____________________________

4. shower  **noun:** ____________________________
   **verb:** ____________________________
SYNONYMSS
Complete the puzzle with words from the reading. Clues are synonyms (words with a similar meaning) of the answer words.

ACROSS
4. places; perhaps cities
5. persistent; unyielding
6. to break up; disappear

DOWN
1. to foresee; anticipate
2. freezing; bitterly cold
3. steady; unchanging
4. to remain; continue

ANTONYMS
Think about the meaning of the boldface word in each phrase. Then circle a letter to show its antonym (word with the opposite meaning). Check a dictionary if you need help.

1. some extreme northern locations
   a. slightly     b. remote      c. unusual

2. will be fairly chilly
   a. windy       b. uncomfortable  c. sweltering

3. snow will continue
   a. cease        b. develop      c. proceed

4. increasing clouds
   a. darkening    b. diminishing  c. fluffier
 Everyone knows that the Earth is teeming with all kinds of plants and animals. Biologists have identified more than a million animals and nearly 400,000 different types of plants. But plants and animals aren’t the only organisms living on Earth. Another classification of living things is called the **fungus kingdom**.

Molds, yeasts, and mushrooms are fungi. Mold grows on damp, decaying things like discarded food or dead trees. To see for yourself, try this experiment:

1. Fill three small cups half full of coffee, and put three slices of bread in clear plastic sandwich bags.
2. Then place one bag of bread and one cup of coffee in each of these places: on a sunny windowsill; in a dark cabinet or closet; in the refrigerator.
3. Every day for two weeks, use a magnifying glass to observe the bread and coffee. Take notes on any changes you see. Draw a sketch if something appears.
4. If you don’t see any change, keep checking for another two weeks.

What will you eventually discover? Fuzzy white stuff will appear on the coffee. White, green, or black stuff will appear on the bread. This is mold—a type of living, growing thing that is neither a plant nor an animal.

**WORD SEARCH**

1. What ten-letter adverb in the reading means “finally” or “in the end”? _________________________
2. What five-letter proper noun in the reading names a planet? _________________________
3. What seven-letter noun in the reading means “in biology, one of the major groups into which all living things are divided”? _________________________
4. What nine-letter plural noun in the reading names a kind of edible fungi that have a stalk and a cap?________________________

ANTONYMS
First unscramble the words from the reading. Then write each unscrambled word next to its antonym (word that means the opposite).

<table>
<thead>
<tr>
<th>NYNUS</th>
<th>GEMTINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAPD</td>
<td>REPAPA</td>
</tr>
<tr>
<td>UZZFY</td>
<td>LUFL</td>
</tr>
<tr>
<td>HEWIT</td>
<td>GINFYAM</td>
</tr>
</tbody>
</table>

1. dry / ____________________ 5. hairless / ____________________
2. vanish / ____________________ 6. barren / ____________________
3. reduce / ____________________ 7. empty / ____________________
4. black / ____________________ 8. gloomy / ____________________

MULTIPLE-MEANING WORDS
Notice how the words type, draw, and mold are used in the reading. Then write original sentences in which the words have completely different meanings. Use a dictionary if you need help.

1. (type) __________________________________________
2. (draw) __________________________________________
3. (mold) __________________________________________
SYNONYMS

Complete the puzzle with words from the reading. Clues are synonyms (words with a similar meaning) of the answer words.

ACROSS
2. rotting 4. a drawing 7. to watch 8. a vegetable
4. a drawing 2. dim 3. thrives 5. swarming 6. almost

DOWN
1. a sack 2. dim 3. thrives 5. swarming 6. almost

ANALOGIES

Remember that an analogy is a statement of relationship. Figure out the relationship between the first two words. Then show the same relationship by completing the analogy with the correct word from the reading.

1. Elephant is to animal as yeast is to ________________________.
2. Alike is to unlike as same is to ________________________.
3. Natural is to cotton as manmade is to ________________________.
4. Ledge is to windowsill as cupboard is to ________________________.
5. Organize is to organization as classify is to ________________________.
6. Plants is to plant as fungi is to ________________________.
7. General is to specific as scientist is to ________________________.
8. Either is to or as neither is to ________________________.
Lesson 4

Two Kinds of Research: Basic and Applied

Research—the quest for information—was born when people first started asking questions and searching for answers. The inventors of the wheel were great researchers. Modern research, based on study and experimentation, got its true start in the 1500s with the work of Galileo.

In the natural sciences—such as biology, chemistry, and medicine—methods of research are very exact. Scientists have developed very accurate instruments such as electronic microscopes.

Basic research is aimed at discovering more about the laws of nature. As they push into the unknown, scholars doing basic research may have little idea of what lies ahead. They may be trying to find out why birds migrate or whether plants grow on Mars. Wishing only to add to the world’s knowledge, they don’t concern themselves with the practical applications of their findings.

Applied research is aimed at a practical goal. Researchers focus on discovering or inventing new and useful products or better ways of doing something. The first synthetic plastic, for example, was developed to find a substitute for ivory in the manufacture of billiard balls. This early plastic—called Celluloid—paved the way for development of today’s enormous plastics industry.

Basic and applied researchers work hand in hand. Applied research is often built on ideas from basic research. In turn, basic researchers depend on applied research for the invention of instruments that make further investigations possible.

WORD SEARCH

1. What five-letter noun in the reading means “a seeking, hunt, or pursuit”? ___________________________
2. What seven-letter verb in the reading means “to move from one region to another with the change of seasons”?  

3. What ten-letter noun in the reading means “something used in the place of another”?  

WORD FORMS

Complete the chart below with different forms of the verbs apply and investigate.

<table>
<thead>
<tr>
<th>APPLY</th>
<th>INVESTIGATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAST-TENSE VERB:</td>
<td>PAST-TENSE VERB:</td>
</tr>
<tr>
<td>NOUN FORM:</td>
<td>NOUN FORM:</td>
</tr>
<tr>
<td>ONE WHO DOES:</td>
<td>ONE WHO DOES:</td>
</tr>
</tbody>
</table>

UNDERSTANDING THE READING

Write T or F to show whether each statement is true or false.

1. _____ Modern research got its start with the discovery of the wheel.

2. _____ Scientists involved in applied research are trying to solve specific problems.

3. _____ The words knowledge and information are synonyms.

4. _____ Basic researchers try to discover more about the laws of nature.
SYNONYMS

Complete the crossword puzzle with words from the reading. Clue words are synonyms (words with a similar meaning) of the answer words.

ACROSS
1. targeted
4. precise
6. data
7. improved

DOWN
2. tools; devices
3. to rely
5. to concentrate

ANTONYMS

First unscramble the words from the reading. Then draw a line to connect each word with its antonym (word that means the opposite).

1. ALARUNT
   __________________________  a. miniature
2. RUTE
   __________________________  b. subtract
3. TRACECAU
   __________________________  c. synthetic
4. NOURSOME
   __________________________  d. useless
5. CATRICLAP
   __________________________  e. false
6. DAD
   __________________________  f. imprecise
Lesson 5

How Does a Radio Work?

The space around you may look empty—but it isn’t. At all times it is filled with radio frequency waves from nearby radio stations. They are causing minute vibrations in all the metal objects in the room. But you can hear these vibrations only if you turn on your radio.

Your radio picks up the radio waves of the station you want to hear and turns them into sound waves. How does it do this?

1. Your radio’s antenna (or aerial wire) picks up all the radio frequency currents that are in the air around it.

2. The tuner selects the frequency of the desired station and blocks out the frequencies of other stations.

3. Now your radio separates the program current from the carrier current. Electronic devices block off the carrier current so that only the program current is left.

4. The program current, which is very weak, must be amplified until it can operate the loudspeaker. This is done by transistors.

5. The loudspeaker changes the program current into sound waves. These sound waves are a copy of those in the broadcasting studio.

WORD SEARCH

1. What eleven-letter plural noun in the reading means “tiny electronic devices made from semiconductors that control the flow of electrical current”?

2. What eight-letter plural noun in the reading means “places with electronic equipment for sending out radio or TV programs”?

AM (amplitude modulation) Radio Wave

FM (frequency modulation) Radio Wave
3. What five-letter adjective in the reading means “made of a chemical—such as iron, gold, or aluminum—that conducts electricity”? ___________________________  

ANTONYMS

Circle a letter to show the antonym (word that means the opposite) of the boldface word in each sentence.

1. *Nearby* radio stations fill the air around you with radio frequency waves.
   a. overlapping               b. faraway               c. powerful

2. In order to operate the loudspeaker, the program current must be *amplified*.
   a. ignited               b. refined               c. silenced

3. The tuner selects the frequency of the *desired* station.
   a. best               b. unwanted               c. chosen

4. The space around you is never *empty*.
   a. quiet               b. occupied               c. hollow

ANALOGIES

*Analogies* are statements of relationship. Figure out the relationship between the first two words. Then show the same relationship by completing the analogy with a word from the reading.

1. *Tongue* is to *taste* as *ear* is to
   ___________________________

2. *Celebrate* is to *celebration* as *vibrate* is to
   ___________________________

3. *Copy* is to *copies* as *frequency* is to
   ___________________________

4. *Gather* is to *scatter* as *combine* is to
   ___________________________
SYNONYMS
Use the clues to help you solve the crossword puzzle. Clues are synonyms (words with a similar meanings) of words from the reading.

ACROSS
1. to duplicate
3. microscopic
6. runs

DOWN
1. generating
2. pulses
4. transforms
5. chooses

PARTS OF SPEECH
In a different context, the same word can be a different part of speech. Notice how the boldface words from the reading are used in each sentence. Then identify the part of speech by writing noun (names a person, place, or thing), verb (shows action), or adjective (describes a noun or pronoun).

1. ________________  Is that information current or out-of-date?
2. ________________  Will you take a minute to answer my question?
3. ________________  Ed programs his computer to do specialized tasks.
4. ________________  The TV programs I like are on Tuesday night.
5. ________________  Minute particles of dust covered the furniture.
6. ________________  The North Atlantic current moves across the ocean from Newfoundland to England.
Rhinoceroses are quiet, slow-moving, retiring animals—until they are cornered. If that happens, watch out! They can charge an enemy at 30 miles an hour.

These huge, thick-skinned animals have heavy bodies and one or two large horns above their nostrils. Their legs are short, and each foot has three toes. They are hoofed animals, related to horses.

The smallest rhinoceros, the Sumatran, usually weighs less than a ton and is about four feet high at the shoulder. The largest is the African white rhinoceros. It may weigh three and one-half tons or more and stand six and one-half feet high.

Some kinds of rhinoceroses have very long horns. The longest one ever measured was 62 1/2 inches. The horns are made of closely packed masses of tough hairs. Their bodies, however, are usually hairless.

There are five different kinds of rhinoceroses living today. Two of these live in Africa, and the other three kinds live in Asia. In captivity, rhinoceroses typically live to be about 50 years old.

Rhinoceroses do not hunt other animals. As herbivores, they eat only grass and other plants. They usually travel alone, but are sometimes found in small family groups. The female bears only one offspring at a time.

WORD SEARCH

1. What eight-letter noun in the reading means “part of the body to which an arm or foreleg is connected”?  
   _________________________

2. What seven-letter adjective in the reading means “of the same family or kind”?  
   _________________________
3. What eight-letter plural noun in the reading means “openings in the nose through which people and some animals breathe and smell”? _________________________

ANTONYMS

Complete the crossword puzzle with words from the reading. Clue words are antonyms (words with opposite meanings) of the answer words. Use a dictionary if you need help.

ACROSS
2. aggressive
4. thin
6. weightless
8. carnivores

DOWN
1. noisy
3. wispy
5. female
7. below

SYNONYMS

Circle a letter to show the synonym (word with a similar meaning) of each boldface word from the reading.

1. The foot of a rhinoceros has three toes.
   a. knuckles      b. hooves      c. digits

2. Rhinoceroses can charge at 30 miles an hour.
   a. postpone  b. launch a running payment  c. take bounding attack leaps

3. If a rhinoceros is cornered, its enemy better watch out!
   a. foe        b. competitor       c. prey
4. Rhinoceroses are sometimes found in small groups.
   a. occasionally       b. rarely       c. typically

5. The horns are made of closely packed masses of tough hairs.
   a. woven          b. dense          c. enclosed

6. Their bodies, however, are usually hairless.
   a. by the way           b. likewise       c. nevertheless

PROPER ADJECTIVES

You read that the smallest rhinoceros is Sumatran. That word is a proper adjective describing someone or something from Sumatra—a large island in Indonesia. On the lines below, write the proper adjective that can be made from each place name. Remember that proper adjectives are always capitalized!

1. Brazil  ____________________  5. England  ____________________
2. Europe  ____________________  6. Russia  ____________________
3. France  ____________________  7. China  ____________________
4. Australia  ____________________  8. Scotland  ____________________

WORD FORMS

Find the word captivity in the reading. You can probably figure out that captivity means “kept in a zoo” or “the condition of being held by force” as it is used in the reading. To complete the sentences below, unscramble some different forms of the word captivity.

1. The zoologists tried to RAPTCUE ____________________ a rhinoceros.
2. The TAPEVIC ____________________ rhino was loaded onto a truck.
3. The rhino’s ROTPACS ____________________ were careful not to injure the animal.
Jean Armour Polly, a former librarian, has been working with computers and modems for 20 years. In a 1992 magazine article, she coined the term “surfing the Internet.” Today, she is a best-selling author. Her book, *The Internet Kids and Family Yellow Pages*, has helped hundreds of thousands of young people learn to navigate the Net safely, comfortably, and productively. The book has recently come out in its fifth edition.

Mrs. Polly says that the best Web sites for young people should meet certain criteria: They should have authority, currency, and an acceptable “signal-to-noise ratio.” No less importantly, the sites should be age-appropriate. Specifically, the author gives this advice:

- **Authority**  Ask yourself who is behind the site. Is it a reputable source such as *National Geographic* or someone you never heard of? Make sure the information comes from a source you can trust.

- **Currency**  Some pages have been on the Web for years without being updated. Look for the “last update” notation on the site’s front page.

- **Age-appropriate**  To learn about how the heart works, middle school students don’t need a lengthy article from a professional medical journal. Instead, find a well-illustrated article written at a lower level.

- **Acceptable mix of signal to noise**  Avoid too many distractions. Things such as ads, pop-up windows, and music that can’t be turned off soon become annoying. They detract from the value of the site.

If you’d like, you can contact Mrs. Polly at www.netmom.com.

**WORD SEARCH**

1. What seven-letter plural noun in the reading means “electronic devices that connect computers via a telephone line”?  ____________
2. What eight-letter proper noun in the reading means “a network linking computers all over the world by satellite and telephone, connecting users with service networks such as e-mail and the World Wide Web”?

3. What twelve-letter plural noun in the reading means “things that interfere with concentration”?

4. What four-letter noun in the reading means “the place where certain information can be found on the Web”?

ANALOGIES

Analogies are statements of relationship. First find the relationship between the first two words. Then show the same relationship by completing the analogy with a word from the reading.

1. Portrait is to artist as book is to

2. Potholes are to highway as problems are to

3. Present is to past as current is to

4. Bear is to bare as sight is to

5. Scissors is to divide as modems are to

6. Music is to musician as library is to

7. Esteemed is to reputable as worth is to

8. Adjective is to adverb as important is to
SYNONYMS

Complete the puzzle with words from the reading. Clue words are synonyms (words with a similar meaning) of the answer words.

ACROSS

3. suitable
4. recency; newness
6. assisted

DOWN

1. to devaluate
2. standards
3. credibility
5. invented

ANTONYMS

First, complete the sentences by unscrambling the words from the reading. Then, on the line after each sentence, write the antonym (word that means the opposite) of the unscrambled word. Antonyms are words in the box.

<table>
<thead>
<tr>
<th>wastefully</th>
<th>questionable</th>
<th>intolerable</th>
<th>concise</th>
<th>soothing</th>
</tr>
</thead>
</table>

1. The terms of the agreement were PACECLABET ____________________ to us, but not to them. ____________________

2. Her simple question did not require a THYGLEN ____________________ explanation. ____________________

3. Al accomplishes more than Ben does, because he uses his time LYVIDROPCUTE ____________________. ____________________

4. The constant dripping of a leaky faucet can be quite NONYGAIN ____________________. ____________________
Here’s your chance to show what you know about the material you studied in Unit 3.

**TRUE OR FALSE**

Write T or F to show whether each statement is true or false.

1. ____ Overview and outlook are compound words.
2. ____ Basic researchers are concerned with the practical applications of their findings.
3. ____ The adjective form of the noun meteor is meteoric.
4. ____ Current and retiring are multiple-meaning words.
5. ____ The words aerial and antenna are synonyms.
6. ____ The adjective form of wave is spelled wavey.
7. ____ Overcast and flurries are words that might be used to describe the weather.
8. ____ Mushrooms are members of the plant kingdom.

**ANTONYMS**

Draw a line to match each boldface word from the unit with its antonym (word that means the opposite).

1. annoying  a. airy
2. current  b. outdated
3. dense  c. unsuitable
4. appropriate  d. soothing
HIDDEN WORDS PUZZLE

Find and circle the words in the hidden words puzzle. Words may go up, down, across, backward, or diagonally. Check off each word as you find it.

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

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

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

_____ WAVEs   _____ MOLD

_____ MASSES   _____ FUZZY

WORDS IN CONTEXT

Now use each word from the puzzle in a sentence of your own. Try to include a scientific fact, explanation, or example in each sentence.

1. fuzzy ________________________________________________
   ______________________________________________________

2. masses _______________________________________________
   ______________________________________________________

3. mold ________________________________________________
   ______________________________________________________

4. waves _______________________________________________
   ______________________________________________________

5. consistent ___________________________________________
   ______________________________________________________

6. quest _______________________________________________
   ______________________________________________________
7. frigid ________________________________
   ________________________________
8. exact ________________________________
   ________________________________
9. particle ________________________________
   ________________________________
10. theory ________________________________
    ________________________________
11. genetics ________________________________
    ________________________________
12. classify ________________________________
    ________________________________

ANALOGIES

Analogy is statements of relationship. Find the relationship between the first two
words. Then show the same relationship by completing the analogy with a word from
Unit 3.

1. Decay is to rot
   as predict is to ____________________

2. Sea is to oceanography
   as earth is to ____________________

3. Radio waves are to antenna
   as sound waves are to ____________________

4. Singular is to plural
   as chromosome is to ____________________

5. Male is to female
   as sperm is to ____________________

6. Occasional is to steady
   as intermittent is to ____________________
Here’s an introduction to the vocabulary terms, concepts, and skills you will study in this unit. Answers are upside down on the bottom of this page.

**SENTENCE COMPLETION**

Circle the words that correctly complete the sentences.

1. The words *categorize* and *classify* are (homonyms / synonyms).
2. Animals without backbones are called (*vertebrates* / *invertebrates*).
3. The word (*exceeds* / *extends*) means “goes beyond what is usual or allowed.”
4. The words *sights* and *sites* are (antonyms / homonyms).
5. WWW is the (*abbreviation* / *nickname*) of the World Wide Web.
6. An outcome that can’t be prevented can be described as (*catastrophic* / *inevitable*).

**TRUE OR FALSE**

Write T or F to show whether each statement is true or false.

1. _____ Astrology is the scientific study of the universe beyond the Earth’s atmosphere.
2. _____ Lead has more density than bread.
3. _____ Healthy humans must have some minerals in their diet.
4. _____ A colony of plants or animals may be scattered all over the Earth.

**ANSWERS:** Sentence Completion: 1. synonyms 2. invertebrates 3. exceeds 4. homonyms 5. abbreviation 6. inevitable

True or False: 1. F 2. T 3. T 4. F
A glossary is an alphabetical list of unusual or specialized words from a certain field of knowledge. Following are some important words from the fields of science and technology.

- **astronomy** the scientific study of the universe beyond the Earth’s atmosphere
- **consumers** organisms that eat other organisms
- **carbohydrates** sugars and starches in food that give people energy
- **density** the amount of matter per each unit of area or volume
- **force** any push or pull on an object
- **habitat** the place where an organism lives
- **host** an animal on or in which a parasite lives
- **minerals** natural substances found in non-living things
- **output** processed data that comes out of a computer
- **radiation** energy that can move through a vacuum
- **spectrum** the rainbow-like band of colors that can be seen when white light is refracted
- **technology** the application of scientific and industrial skills to practical use
- **turbine** a machine driven by the force of a moving fluid
- **vacuum** the absence of matter
- **weathering** the process that breaks down rocks and minerals

**WORDS IN CONTEXT**

Complete each sentence with the correct word from the glossary. If you’re not sure about some words, check a dictionary.

1. That woodland stream is the ________________ of beavers.
2. Over time, erosion and ________________ can wear down an entire mountain range.
3. Light, heat, radio waves, and X-rays are different kinds of _____________.

4. Scientists who study ________________ learn about the size and motion of the stars.

5. A hog or a cow may be the _______________ of a parasite such as a tapeworm.

6. A healthy diet for humans includes such _______________ as iron and salt.

7. Animals are called ________________ because they cannot make their own food.

8. If nearly all the air is removed from a bottle, a _______________ is formed inside.

9. Gravity is the ________________ that holds us on the ground.

10. There are seven colors in the _______________ of visible light.

11. Because a rock has greater _______________ than water, it will sink in a pond.

12. Your computer monitor is an ________________ device.

13. Engineers and mechanics use ________________ to solve practical problems.

14. Good sources of ________________ include vegetables, grains, and potatoes.

15. A powerful ________________ engine uses the water in a dam to create electricity.
ANALOGIES

Analogies are statements of relationship. To complete an analogy, figure out the relationship between the first pair of words. Then write the word from the reading that shows the same relationship.

1. Keyboard is to printer
   as input is to ______________________.
2. Total is to partial
   as erosion is to ______________________.
3. Wind is to windmill
   as fluid is to ______________________.
4. Plants are to producers
   as animals are to ______________________.
5. Flower is to botany
   as planet is to ______________________.
6. Meat is to protein
   as doughnut is to ______________________.

CATEGORIES

Write the boxed items under the correct headings.

<table>
<thead>
<tr>
<th>desert</th>
<th>bread</th>
<th>quartz</th>
<th>monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>fruits</td>
<td>ocean</td>
<td>printer</td>
<td>rain forest</td>
</tr>
<tr>
<td>silver</td>
<td>noodles</td>
<td>zinc</td>
<td>disk drive</td>
</tr>
</tbody>
</table>

1. HABITATS

________________________________________
________________________________________
________________________________________

2. CARBOHYDRATES

________________________________________
________________________________________
________________________________________

3. COMPUTER OUTPUT DEVICES

________________________________________
________________________________________
________________________________________

4. MINERALS

________________________________________
________________________________________
________________________________________
Rabbits and hares were once classified as rodents. After all, just like rodents, they have two pairs of big gnawing teeth, or incisors, in the front of their jaws. But rabbits and hares also have a second, smaller pair of upper incisors. Because of this and other differences, rabbits and hares are now placed in a separate order from rodents.

In general, rabbits and hares are a lot alike. They both have big, long ears and stubby tails. They have short front legs and long, powerful hind legs that make them expert runners and leapers. And they are both vegetarians that eat grass, leaves, tender buds, and twigs.

But rabbits are usually smaller than hares, and their ears are not so long. At birth, the young of rabbits are blind, naked, and helpless. In contrast, newborn hares are born wide-eyed and fully furred. They are able to hop about on the day of their birth.

True rabbits dig far-reaching burrows and bear their young in an underground nest. Hares, on the other hand, make their nests in hollows in the ground. (So does the cottontail—but in all other ways it is a true rabbit!)

**WORD SEARCH**

1. What seven-letter plural noun in the reading means “a very large order of gnawing mammals”? ______________________________

2. What four-letter plural noun in the reading means “plant swellings from which leaves or flowers develop”? ______________________________
3. Which seven-letter plural noun in the reading means “underground holes or tunnels”? ______________________________

ANTONYMS

Complete the crossword puzzle with words from the reading. Clues are antonyms (words that mean the opposite) of the answer words.

ACROSS
1. front
5. unskilled
6. larger

DOWN
2. covered
3. bald
4. lower

SYNONYMS

First unscramble the words from the reading. Then write each unscrambled word next to its synonym (word with a similar meaning).

| WOLPRUF E | DERENT |
| BUSBYT | LUAUSLY |
| SAI CFIELDS | AKEIL |

| 1. similar / ______________ | 4. ordinarily / ______________ |
| 2. soft / ______________ | 5. mighty / ______________ |
| 3. short / ______________ | 6. categorized / ______________ |
CATEGORIES
List each word in the box under the correct heading.

<table>
<thead>
<tr>
<th>newborn</th>
<th>underground</th>
<th>helpless</th>
<th>longer</th>
<th>vegetarian</th>
<th>cottontail</th>
</tr>
</thead>
</table>

1. **COMPOUND WORDS**

2. **WORDS WITH SUFFIXES**

| ___________________________ | ___________________________ |
| ___________________________ | ___________________________ |
| ___________________________ | ___________________________ |

HOMONYMS

*Homonym* are words that sound the same but have different meanings and spellings. First write a homonym for each **boldface** word from the reading. Then write a sentence that contains both words. The first one has been done for you.

1. **hare** / **hair**
   
   *The hair on that hare is a beautiful brown color.*

2. **pairs** / ___________________________
   
   ___________________________

3. **bear** / ___________________________
   
   ___________________________

4. **tails** / ___________________________
   
   ___________________________

5. **two** / ___________________________
   
   ___________________________
Many animals, from a flea to an elephant, can be taught to perform tricks. But these acts tell us little about learning ability. An animal’s intelligence is measured by how it manages a new situation and how well it solves problems.

The maze is one method scientists use to test animal intelligence. A maze contains a number of confusing pathways. In a scientific test, the animal’s task is to discover the path that leads to food or some other reward. How many attempts does the animal make to find its way through the blind alleys of the maze? And how long does the animal remember what it has learned? The answers to these questions are strong indications of the animal’s learning and memory capacities.

Which animals are smarter? In learning how to solve new problems, vertebrates are usually superior to invertebrates. Chimpanzees, dogs, cats, and rats make high scores on various tests. But there are wide differences among individual animals of the same species. Some bees, ants, and cockroaches, for example, are much brighter than other members of the same colony.

Here are a few fascinating facts about animal intelligence:

- Many fish have color vision and can recognize each other by color patterns on the head.
- Squirrels, like some birds, have a sense of numbers.
- An octopus can run mazes and differentiate between a circle, a square, and a triangle.
- Toads and frogs learn to respond to their caretakers.

WORD SEARCH

1. What thirteen-letter verb in the reading means “to tell the difference between”? 

   d ________________________________
2. What thirteen-letter plural noun in the reading means “creatures without backbones”?

3. What six-letter noun in the reading means “a group of animals or plants living or growing together”?

4. What eight-letter verb in the reading means “found out the exact size, amount, or extent of something”?

SYNONYMS
Complete the crossword puzzle with words from the reading. Clues are synonyms (words with a similar meaning) of the answer words.

ACROSS
2. signs
4. designs
6. tries
7. bewildering

DOWN
1. smarter
3. abilities; skills
5. answers; explains

CATEGORIES
Write examples from the reading that belong to each category.

1. three geometric figures:
   __________________________
   __________________________
   __________________________

2. four insects:
   __________________________
   __________________________
   __________________________
   __________________________
WORD FORMS
Complete the chart. If the **boldface** word is a *noun*, write its verb form. If the word is a *verb*, write its noun form.

<table>
<thead>
<tr>
<th>VERBS</th>
<th>NOUNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. recognize</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>colony</td>
</tr>
<tr>
<td>3. measure</td>
<td></td>
</tr>
<tr>
<td>4. perform</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>memory</td>
</tr>
<tr>
<td>6. solve</td>
<td></td>
</tr>
</tbody>
</table>

ANTONYMS
Unscramble the words from the reading. Then write each one next to its *antonym* (word that means the opposite).

<table>
<thead>
<tr>
<th>DRAWER</th>
<th>INVALIDUDI</th>
<th>ROPERIUS</th>
<th>SCANTIGAFIN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. boring / _____________________  3. inferior / ____________________
2. group / _____________________  4. punishment / ____________________

WORDS IN CONTEXT
Circle a letter to show the meaning of the **boldface** word or words.

1. An animal must find its way around **blind alleys**.
   a. scary streets  b. dark passages  c. dead-end paths

2. Toads and frogs **respond** to their caretakers.
   a. recognize  b. give intelligent answers to  c. try to please and impress
Lesson 4

Why Are Deserts Dry?

By definition, deserts are simply regions where the annual amount of evaporation exceeds the annual amount of precipitation. These stark, arid stretches of land cover about 30 percent of the Earth’s surface. The Sahara Desert of Northern Africa is the world’s largest. It covers an area of three and a half million square miles.

There are two distinct types of deserts: subtropical and midlatitude. Subtropical deserts cover vast expanses between 10 degrees and 30 degrees latitude. High-pressure atmospheric conditions in those regions cause the air to sink and grow warmer. Subtropical deserts include those in Arizona, the Sahara, the Arabian Peninsula, and most of Australia’s interior.

Midlatitude deserts are usually found on the downwind side of major geographic barriers. These barriers—mountain ranges such as the Sierra Nevada, the Himalayas, and the Andes—block a large percentage of moisture-laden winds. The Great Basin, a cool desert of North America, is a good example of a midlatitude desert. The Great Basin developed because of the “rain shadow” produced by the Sierra Nevada.

Some deserts were formed because the prevailing winds are too far away from large bodies of water. Two deserts in such interior locations are the Gobi and the Turkestan in Asia.

WORD SEARCH

1. What ten-letter adjective in the reading means “most common or frequent”? ___________________________

2. What ten-letter noun in the reading means “a certain part or amount in every hundred”? ___________________________
3. What seven-letter verb in the reading means “goes beyond what is usual or allowed”? ___________________________

ANTONYMS
Complete the crossword puzzle with words from the reading. Clues are antonyms (words that mean the opposite) of the answer words.

ACROSS
2. alike; same
3. small
4. minor
6. upwind

DOWN
1. exterior; coastal
2. rain forest
5. humid; damp

THE PREFIX mid-
The prefix mid- means “middle or middle part.” Complete the sentences below with a word beginning with mid-. Use a dictionary if you need help.

1. The two small planes met in a ________________________ collision.

2. ________________________ is the halfway point between dusk and dawn.

3. Chicago, Illinois and Omaha, Nebraska are ________________________ cities.

4. Students take ________________________ tests halfway through the semester.

5. The cafeteria serves lunch at ________________________.
MULTIPLE-MEANING WORDS

Some words have entirely different meanings when they are used in different contexts. Unscramble the multiple-meaning words from the reading. Then write a sentence for each meaning shown.

1. SEGNAR ________________
   a. (noun) rows or lines of connected mountains ________________
   ____________________________________________________________
   b. (verb) roams or wanders about freely ________________
   ____________________________________________________________

2. CHESTRETS ________________
   a. (noun) unbroken distances____________________________
   ____________________________________________________________
   b. (verb) draws out to full length or to a greater size ________________
   ____________________________________________________________

3. BOLCSK ________________
   a. (verb) stops movement or progress________________________
   ____________________________________________________________
   b. (noun) wooden or plastic toy bricks or cubes _____________________
   ____________________________________________________________

SYNONYMS

Draw a line to match each boldface word from the reading with its synonym (word with a similar meaning).

1. stark                          a. loaded
2. barriers                      b. developed
3. laden                         c. obstructions
4. formed                        d. bleak
Lesson 5

Q&A Sites on the Internet

Do you need the answer to a tricky question? Would you like some help understanding a difficult concept? You can always try one of the Question and Answer (Q&A) sites on the World Wide Web. These are places you can submit a question for an expert to answer. Before you start clicking, however, there are a few things you should know.

Most Web sites offering expert assistance also keep an archive. This is a collection of all previous questions and answers—or at least the most frequently asked questions (FAQs). So check out the site’s archive before submitting your question. If your question has already been answered in their archive, some sites will not respond to your e-mail.

Other sites require a certain time frame to respond—perhaps two days, or even longer. Still other sites select and answer only one question of all those received in a day or a week. And they answer it only on a message board. That means you have to visit the message board frequently to see if your question was chosen. Some interesting Q&A sites are listed below. Just remember that Web sites change frequently. If one site doesn’t work, try another one!

- www.howstuffworks.com for help with science projects
- www.science.ca/ask/ 150 Canadian scientists answer your questions
- www.ipl.org/youth/ great references for kids from the Internet Public Library

WORD SEARCH

1. What seven-letter noun in the reading means “a general idea of what a thing or a group of things is”? _________________________
2. What ten-letter plural noun in the reading means “books or other sources of information”?

3. What eight-letter verb in the reading means “putting forward for someone to take or refuse”?

WORDS IN CONTEXT
Circle a letter to show the meaning of the **boldface** words in the sentences.

1. Many Web sites provide **FAQs** to provide help quickly.
   a. Fast Accurate Quotes
   b. Facts and Quality
   c. Frequently Asked Questions

2. If you can imagine a subject, you can find out about it on the **Internet**.
   a. international network of electronically connected computers
   b. a search engine such as www.yahoo.com
   c. Web pages with customized information

3. Your question may be answered on the site’s **message board**.
   a. an organization’s list used for regular mailings
   b. area on a Web site where users post comments and read the comments of others
   c. an educational chat room for regular users

4. Some sites respond only within a certain **time frame**.
   a. date and time of day framed on the screen
   b. information about the time an event occurred
   c. period of time during which something is planned to take place
HOMONYMS

Homonyms are words that sound alike but have different meanings and sometimes different spellings. Clue words are homonyms of words from the reading. Use words from the reading to complete the crossword puzzle.

ACROSS     DOWN
3. sights   1. knot
4. to       2. weak
6. no       3. sum
7. sea      5. ewe

SYNONYMS AND ANTONYMS

Write S or A next to each word pair to show whether the words are synonyms (words with a similar meaning) or antonyms (words with opposite meanings).

1. _____ submit / receive 5. _____ frequently / rarely
2. _____ perhaps / maybe 6. _____ require / need
3. _____ respond / answer 7. _____ expert / amateur
4. _____ chosen / rejected 8. _____ previous / earlier

ANALOGIES

Analogies are statements of relationship. Figure out the relationship between the first two words. Then complete the analogy with a word from the reading that shows the same relationship.

1. Gymnasium is to gym as mathematics is to ____________________.
2. Later is to subsequently as earlier is to ____________________.
3. Money is to budget as time is to ____________________.
4. Send is to submit as reply is to ____________________.
Scientists agree about one thing: The world’s most famous volcano will erupt again. The only active volcano on the mainland of Europe, Vesuvius is currently the subject of a bitter dispute. One volcanologist says that state-of-the-art equipment will give two or three weeks’ warning before a major eruption occurs. That would be enough time to evacuate the 700,000 people who live on Vesuvius’s slopes.

Another leading expert disagrees, however. He says that precursor signs—such as increased seismic activity and changes in the water table—won’t save anybody. He insists that such signs may be evident for months or even years in advance of a big blow. He maintains that it’s impossible to pinpoint the time of an eruption. And according to him, quickly evacuating so many people is hopelessly impractical. Disaster planners are closely monitoring the debate.

Looming over the Bay of Naples, Italy, Vesuvius is a catastrophe waiting to happen.

In 79 A.D., a tremendous flow of hot lava cascaded down the mountain in convulsive waves. The city of Pompeii was buried alive in less than 48 hours. Such an eruption today would certainly reach the coastal plain in six minutes, wiping out everything in its path. How to prepare for the inevitable is the only question.

WORD SEARCH

1. What fourteen-letter plural noun in the reading names scientists who specialize in the study of volcanoes? _____________________________

2. What seven-letter adjective in the reading describes an effect “caused by an earthquake or explosion”? _____________________________
3. What seven-letter adjective in the reading describes something that comes into sight in a sudden, frightening way? _____________________________

ANTONYMS

*Antonyms* are words with opposite meanings. Unscramble the words from the reading and write them next to their antonyms.

1. **SUMOAF**
   
   __________________ / unknown

2. **TONGRINIOM**
   
   __________________ / ignoring

3. **NYCETRIAL**
   
   __________________ / doubtfully

4. **PINTONIP**
   
   __________________ / guess

5. **TICAVE**
   
   __________________ / extinct

6. **TRIBET**
   
   __________________ / mild

SYNONYMS

Complete the crossword puzzle with words from the reading. Clues are *synonyms* (words with a similar meaning) of the answer words.

**ACROSS**

3. argument
5. plain; clear
6. explode
8. enormous

**DOWN**

1. topic
2. forerunner
4. unavoidable
7. indications
WORDS IN CONTEXT
Circle a letter to show the meaning of the boldface words. If you need help, check a dictionary.

1. Lava and burning ashes cascaded down the mountain.
   a. exploded in    b. quickly flowed    c. mushroomed in all directions in large amounts a dark cloud

2. Would residents have enough time to evacuate?
   a. immediately leave b. board up c. evaporate the for safety’s sake their homes hot lava

3. Can state-of-the-art equipment warn of an eruption?
   a. finest instruments b. artistic c. most advanced in the state renderings technology

   a. curving outward, b. uncontrollably c. very dense not inward jerky and shaky and heavy

5. On the mainland of Europe, Vesuvius is the only active volcano.
   a. not an island b. most important c. centrally or a peninsula region located

WORD FORMS
Rewrite each boldface word from the reading in the form of an adjective or a noun. Check a dictionary if you’re not sure of the spelling.

<table>
<thead>
<tr>
<th>ADJECTIVE FORM</th>
<th>NOUN FORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>volcano</td>
<td>active</td>
</tr>
<tr>
<td>catastrophe</td>
<td>erupt</td>
</tr>
<tr>
<td>disaster</td>
<td>occur</td>
</tr>
</tbody>
</table>
## Lesson 7

### Noise Pollution: How Loud Is Too Loud?

Warnings about the dangers of air and water pollution are frequently in the news. But noise pollution is also a serious problem in the modern world. City-dwellers are especially vulnerable since noise levels are higher in urban areas. Loud noise stresses the nerves in your ears. If the excessively loud noise continues for a long time, your ears can be damaged permanently.

Did you know that the intensity of sound is measured in decibels (dB)? A very faint noise, such as the sound of human breathing, is about 5 dB. If someone shouts in your ear, the sound level may reach 100 dB. Sound levels above 120 dB cause physical pain. At 140 dB, extremely loud sound can break your eardrums, and at 180 dB, it can kill you! Hearing loss is common in people who work around constantly thunderous, roaring, or shrieking sounds.

Besides damaging your hearing, noise pollution can hurt you in other ways. When people are exposed to noise levels above 70 dB, their blood pressure and pulse rates increase. Because their bodies are under stress, they become tense and irritable.

### WORD SEARCH

1. What nine-letter noun in the reading means “the quality of having great strength or force”? __________________________

2. What ten-letter adverb in the reading means “steadily and invariably, without stopping”? __________________________

3. What nine-letter noun in the reading means “corrupted condition caused by an outside influence”? __________________________
4. What six-letter plural noun in the reading means “bodily fibers that connect organs, muscles, etc. to the brain and spinal cord”? ___________________________

**ANTONYMS**

Complete the crossword puzzle with words from the reading. Clues are *antonyms* (words that mean the opposite) of the answer words.

**ACROSS**

3. diminish
6. shielded
7. joyful

**DOWN**

1. rural
2. temporarily
4. unusual
5. ancient

**SYNONYMS**

Unscramble the words from the reading. Then write the unscrambled words next to their *synonyms* (words with a similar meaning).

1. **GAMEAD**
   
   __________________ / injury

2. **ARKEB**
   
   __________________ / rupture

3. **IOURSSE**
   
   __________________ / severe

4. **STOUSH**
   
   __________________ / yells
ANALOGIES

Analogies are statements of relationship. Find the relationship between the first two words. Then write a word from the reading that shows the same relationship between the second pair of words.

1. *Fahrenheit* is to *F* as *decibel* is to ____________.
2. *Damage* is to *injury* as *strain* is to ____________.
3. *Finger* is to *knuckle* as *ear* is to ____________.
4. *Effect* is to *cause* as *flood* is to ____________.
5. *Soft* is to *whisper* as *loud* is to ____________.
6. *Adjective* is to *noun* as *intense* is to ____________.

WORD COMPLETION

Add vowels (*a, e, i, o, u*) to complete the words in the sentences.

1. Increased bl__ __d pressure and pulse r__t__s are two signs of physical stress.
2. A person with c_ _mpl__t__ hearing loss is d__ __f.
3. If you are in a good m__ __d, you are not a bit  __rr__t__bl__.
4. Respiration is the scientific term for br__ __th__ng.
5. A  f__ __nt sound is very low and s__ft.
6. The adjective form of the noun str__ss is str_ _ssf__l.
SPELLING
Circle the correctly spelled word in each group.

1. vaccum               vacuum               vaccume
2. weathering               whethering               wethering
3. diffrences               diferrences               differences
4. intellagence               intelligense               intelligence

WORD FORMS
To correctly complete each sentence, add a suffix to the boldface word. Write the new word on the line.

1. One who **pollutes** is called a ____________________.
2. A book or Web site you **refer** to for information is called a ____________________.
3. When you **submit** a question to a Web site, your question is your ____________________.
4. A scientist who studies **volcanoes** is a ____________________.

MYSTERY WORDS
To complete the sentences, write the unscrambled words on the lines.

1. An VERAICH __________________ is a Web site’s collection of FAQs.
2. To NOTPINIP __________________ something is to identify it exactly.
3. The place where an organism lives is its THABAIT __________________.
HIDDEN WORDS PUZZLE

Find and circle the words in the hidden words puzzle. Words may go up, down, across, backward, or diagonally. Check off each word as you find it.

_____ ERUPT _____ BURROWS

_____ HARES _____ HOMONYMS

_____ DESERT _____ SUPERIOR

_____ MAJOR _____ DOWNWIND

_____ RANGE _____ INTERNET

_____ SUBMIT _____ ARCHIVE

WORDS IN CONTEXT

Now use each word from the puzzle in a sentence of your own. Try to include a scientific fact, explanation, or example in each sentence.

1. archive __________________________________________________________

2. submit __________________________________________________________

3. burrows _________________________________________________________

4. erupt ____________________________________________________________

5. hares ____________________________________________________________

6. homonyms _______________________________________________________

103
7. desert __________________________________________________________

______________________________________________________________

8. superior __________________________________________________________

______________________________________________________________

9. major __________________________________________________________

______________________________________________________________

10. range __________________________________________________________

______________________________________________________________

11. Internet _________________________________________________________

______________________________________________________________

12. downwind _______________________________________________________

______________________________________________________________

ANALOGIES

Analogies are statements of relationship. Find the relationship between the first two words. Then show the same relationship in the second pair of words by completing the analogy with a word from Unit 4.

1. Fall is to snow as cascade is to ____________________________.
2. Explode is to explosion as erupt is to ________________________.
3. Yesterday is to outdated as now is to ________________________.
4. Much is to little as loud is to ____________________________.
5. Sound is to homonyms as meaning is to ____________________.
6. Lion is to consumer as dandelion is to ____________________.
SCIENCE AND TECHNOLOGY WORDS

END-OF-BOOK TEST

ELEMENTS OF VOCABULARY

• Complete the crossword puzzle with a word that names the category that could label the clue words. Answers are some of the elements of vocabulary you’ve been working with in this book.

ACROSS
2. student, Paris, loyalty
4. red, electric, spongy
6. are, jump, think
7. therm, gen, vit

DOWN
1. -ment, -ance, -ist
3. inter-, pro-, anti-
4. soon, slowly, awkwardly
5. daybreak, snowshoe, barnyard

• Now write three examples of your own for each element of vocabulary (crossword puzzle answers).

1. ELEMENT: ______________________
   EXAMPLES: ____________________  ____________________  ____________________

2. ELEMENT: ______________________
   EXAMPLES: ____________________  ____________________  ____________________

3. ELEMENT: ______________________
   EXAMPLES: ____________________  ____________________  ____________________

4. ELEMENT: ______________________
   EXAMPLES: ____________________  ____________________  ____________________
HOMONYMS

Homonyms are words that sound exactly alike, but have different meanings and often, different spellings. First figure out a homonym for each boldface word from the book. Then write a phrase, describing your homonym with two appropriate adjectives. The first one has been done for you.

HOMONYM PHRASE

1. sun son her oldest, tallest son
2. chilly _______________
3. flower _______________
4. hare _______________

PLURALS

Write the correct plural form of each boldface word from the book. If you need help, check a dictionary.

1. kidney _______________
2. fungus _______________
3. species _______________
4. bacterium _______________
5. alley _______________
6. criterion _______________
7. memory _______________
8. flurry _______________
9. ability _______________
SILENT LETTERS
Find and circle the silent letter in half the words listed below.

gnawing liver aerial focus
respond autumn modem knowledge

ANTONYMS
Find and circle the words hidden in the puzzle. Words may go up, down, across, backward, or diagonally. Check off each word as you find it. When you have circled all the words, write each word next to its antonym (word that means the opposite).

_____ EXTINCT _____ PARASITE
_____ SOLID _____ INTERIOR
_____ MULTIPLE _____ LATITUDE
_____ URBAN _____ CONDENSATION
_____ INFERIOR _____ OUTPUT
_____ MAJOR _____ VOWELS

1. consonants / ________________ 7. living / ________________
2. minor / ________________ 8. host / ________________
3. liquid / ________________ 9. evaporation / ________________
4. exterior / ________________ 10. single / ________________
5. input / ________________ 11. rural / ________________
6. longitude / ________________ 12. superior / ________________
WORDS IN CONTEXT
Circle a word to correctly complete each sentence.

1. Rabbits and hares have a second pair of upper (incisors/appendages).
2. Noise levels are measured in (Hz/dB).
3. (Evaporation/Elevation) determines whether precipitation will fall as rain or snow.
4. Scientists have identified 103 (organic/chemical) elements.
5. The (tuners/transistors) in a radio amplify the program current.
6. *Carnivore* is to *meat-eater* as *herbivore* is to
   (vegetarian/cold-blooded).

COMPOUND WORDS
First unscramble the compound words. Then use each unscrambled word to complete one of the sentences.

<table>
<thead>
<tr>
<th>DROOLBETAMS</th>
<th>NAILMAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLINTHUS</td>
<td>THAWGENVEL</td>
</tr>
</tbody>
</table>

1. Calcium is released as needed into the _____________.
2. The distance between successive crests on the ocean’s surface is called the _____________.
3. As it passes through ice crystals, ____________ refracts and appears as sun dogs.
4. Vesuvius is the only active volcano on the _____________ of Europe.
| Abbreviation | ability | absorb | adjective | advance | adverb | aerial | African | amino acids | amplified | analogy | Andes | annual | Antarctica | antenna | antonym | ants | appendage | application | applied research | appropriate | Arabian Peninsula | archive | arctic | area | arid | Arizona | astronomy | atmosphere | atoms | Australia | author | authority | axis | Bacteria | barriers | basic research | bees | biologists | bit | bitter | blind alley | blood pressure | bloodstream | blubber | boldface | botany, botanist | branch | brittle | broadcasting | buds | burrows | byte | Calcitrol | calcium | campus | capacity | captivity | carbohydrates | carbon | carbon dioxide | caretaker | cascade | catastrophe | category | cell | Celluloid | challenges | characteristics | chemistry | chilly | chimpanzee | chromosomes | cirrus | classification | classify | climate | coastal | cockroach | cold-blooded | colony | compound | computers | concepts | condensation | conditions | confirm | consistent | constant | consumers | context | continents | contrary | contrast | convulsive | cottontail | crests | criteria | crust | crystals | currency | currents | cycle | cyclone | Damage | debate | decaying | decibels (dB) | degrees (°) | dense | density | desert | detract | devastating | devised | diagonally | differentiate |
digital
disaster
discovery
disk drive
diskettes
disprove
dispute
dissipate
distinct
distinguishing
distractions
document
downwind
dynamic

Eardrum
ecology
ecosystem
egg
electromagnetic
electronic
element
elephant
elevated, elevation
endangered
energy
enormous
environment
equipment
erosion
erupt
essential
evacuate
evaporation
evident, evidence
evolution
exact
exceed
excessively
expanses
experiment
expert
exposed, exposure
extent
extinct
Factors
faint
fascinating
features
fertilization
findings
flea
flurries
focus
food chain
force
fossils
frequency
frigid
fungi, fungus
furred
fuzzy
Gas
genetics
geographic
geology
germinate, germination
glossary
gnawing
Gobi
graphite
greenhouse

Habitat
halos
hare
harpoon
hazardous waste
helium
herbivore
hertz
hexagonal
high-pressure system
Himalayas
hind
hollows
homonym
hoofed
horizon
horizontal
horns
host
hydrogen
hypothesis

Incinerate
incisors
individuals
industrious
industry
inevitable
inferior
information
inland
input
instruments
intensity
interaction
interior
intermittent
Internet
intervals
inventions, inventor
invertebrates
investigations
involved
irritable
Italy

Jet stream

Kidneys
kilo-
kingdom
knowledge
SCIENCE AND TECHNOLOGY WORDS

WORD LIST

Landfill
latitude
lava
laws of nature
lenses
life science
linger
liquid
liver
locations, locales
longevity
longitude
looming

Magma
magnifying glass
mainland
maintains
major
mammal
manufacture
Mars
masses
matter
maze
measure
mega-
memory
mercury
message board
metal
meteor
microscopes
midlatitude
migrate
minerals
minute
modem
modern
moisture
mold
molecules
monitor

monitoring
mountain ranges
mullein plants
multiple

Naked
Naples
nature
navigate
nest
newborn
noise
nostrils
notation
noun
nucleus
nutrient
nutrition

Objects
observation
oceans
offshore
offspring
operate
opposite
order
organic chemistry
organisms
oriented
outlook
output
overcast
overview
oxygen
ozone

Parallel
parasite
parhelia
particle
parts of speech
pattern

percentage
permanently
perpendicular
phenomenon
physics, physicist
pinpoint
plain
planet
plastics
plural
polar
pollute, pollution
Pompeii
practical
Precambrian era
precipitation
precursor
prefix
preliminary
prevailing winds
process
produced
productive
professor
projected
proper adjective
proper noun
properties
pulse
pursuit

Qualities
quartz
quest

Rabbit
radiation
radio frequency
waves
rain forest
rain shadow
rate
ratio
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</table>

reaction, reflect, refracting, regenerated, regions, relationship, relentless, reputable, research, respiration, respond, retardation, retiring, rhinoceros, rodent

Satellite, scholars, scientific method, score, seas, seedlings, seismic, Sierra Nevada, signal, site, skeptical, sketch, slopes, solar system, solid, sound waves, source, space, species, specific, spectrum, spongy, square miles, stark, state-of-the-art, stations, stomach, stratus, stress, stretches, subject, submit, substance, substitute, subtropical, successive, suffix, Sumatran, sun dogs, superior, surf, surface, swells, synonym, synthetic, Task, technical, technology, teeming, telegraph, terminate, test, theory, thermometer, thunderous, time frame, tissue, topography, transistors, transmit, tremendous, tuner, turbine, Turkestan, twigs, Ultraviolet, underground, undulations, unearthed, unit, universe, updated, upwind, urban, Vacuum, various, vast, vegetarians, verb, verify, vertebrates, Vesuvius, vibrations, vitality, vocabulary, volcanologist, volt, vowels, vulnerable, Warm-blooded, water cycle, water table, wave, wavelength, waves, weathering, Web sites, wither, Zinc
SCIENCE AND TECHNOLOGY WORDS

- Science in the News
- Computers and the Net
- The Natural World
- Observations and Experiments

Everyday Living Words
History and Geography Words
Media and Marketplace Words
Music, Art, and Literature Words
Science and Technology Words
Workplace and Career Words