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VOCABULARY

SCIENCE AND TECHNOLOGY WORDS

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

VOCABULARY
in context

ELLIOTT QUINLEY

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



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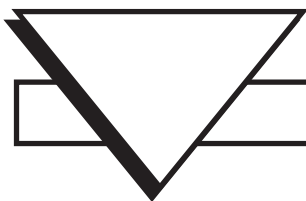
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INTRODUCTION

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.

PREVIEW

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 germenate

GLOSSARY

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.

- Life science is the study of all the _____ on Earth.
- Fruits, vegetables, and grains are all good sources of _____.
- Some _____ are useful for making foods such as cheese; other kinds can cause sickness and death.
- There are two hydrogen _____ and one oxygen _____ in a water molecule.
- 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.

- ALTIME** _____
- ODFO ACHIN** _____
- COYLOGE** _____
- MYSTERCHI** _____
- STRUC** _____
- HERPOSTMAE** _____

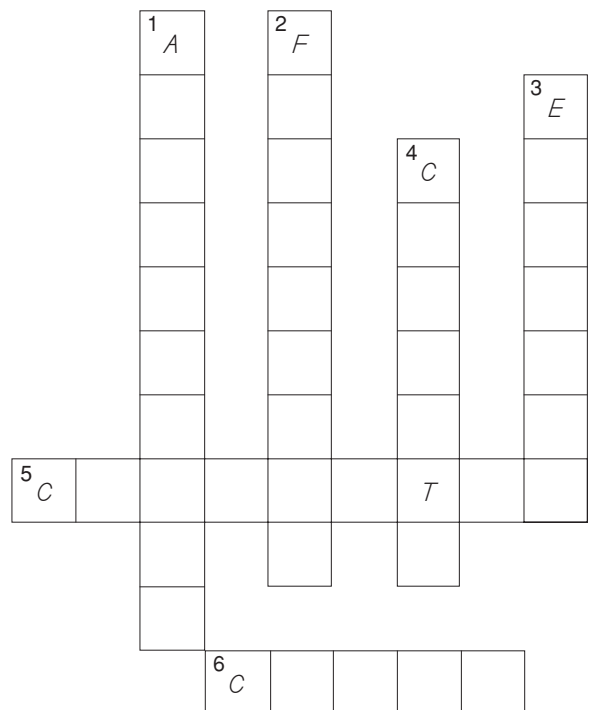
ACROSS

- _____ is the study of what matter is made of and how it can change.
- The continents and the ocean floor are part of the Earth's _____.

DOWN

- The _____ extends more than 1,400 miles above the Earth's surface.

- Each of the organisms in a _____ (two words) eats one of the other organisms.
- The study of the relationship between different populations in a habitat is called _____.
- 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 bacterial infection can usually be treated with an antibiotic.
2. As weather r d s rocks, salt from the rocks enters the soil.
3. t m c energy is used to power some submarines.
4. Ch m sts often conduct their experiments in laboratories.
5. Over time, organisms will f s s l z if all the conditions are right.
6. All of today's plants and animals v l v d from tiny one-celled creatures.
7. Scientists call lightning an " tm sph 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

How Does Sunlight Produce Vitamin D?

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 SEARCH

1. What eight-letter word in the reading means “the smallest particle of a substance that can exist alone without losing its chemical form”? *m* _____
2. What three organs of the human body are named in the reading?
k _____ *s* _____ *l* _____
3. What nine-letter word in the reading means “food” or “nourishment”? *n* _____
4. What two-syllable word in the reading means “to attract and take in another substance”? *a* _____

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 unlike. Complete the following analogies with words from the reading.

1. *Biology* is to *biologist* as c _____ is to *chemist*.
2. *Adjust* is to *readjust* as *action* is to r _____.
3. *Athlete* is to *athletic* as e _____ is to *energetic*.
4. *Multiply* is to *multiplication* as r _____ is to *rearrangement*.

RHYMING WORDS

Write words from the reading that *rhyme* with the words below.

FIRST PARAGRAPH:

- | | |
|----------------|----------------|
| 1. plead _____ | 3. shore _____ |
| 2. fizz _____ | 4. break _____ |

SECOND PARAGRAPH:

- | | |
|-----------------|------------------|
| 1. voting _____ | 3. drowned _____ |
| 2. heart _____ | 4. buried _____ |

THIRD PARAGRAPH:

- | | |
|-----------------|----------------|
| 1. strung _____ | 3. fluff _____ |
| 2. plate _____ | 4. leaps _____ |

SYNONYMS

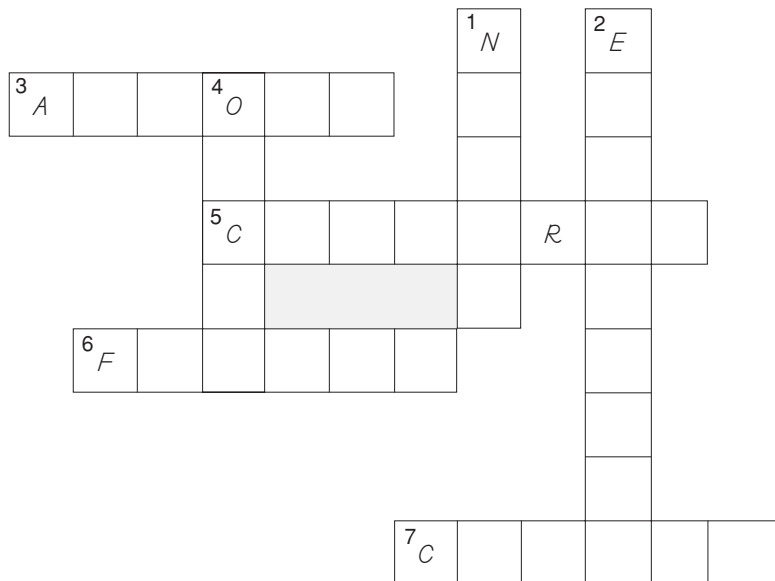
Complete the puzzle with words from the reading. Clue words are *synonyms* (words with a similar meaning) of the answer words.

ACROSS

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

DOWN

1. requires
2. important
4. happen

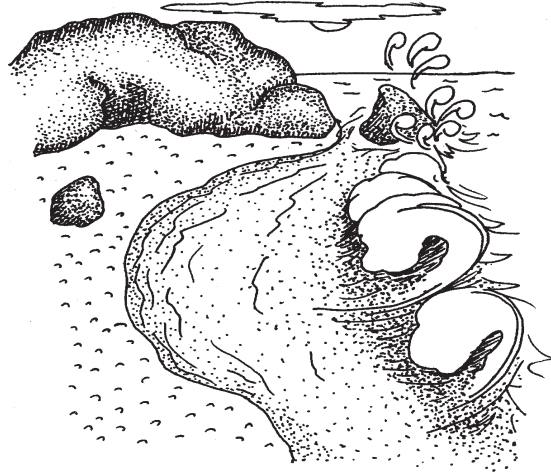


Waves, Surf, Seas, and Swells: What's the Difference?

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”?

t _____

s _____

WORDS AND MEANINGS

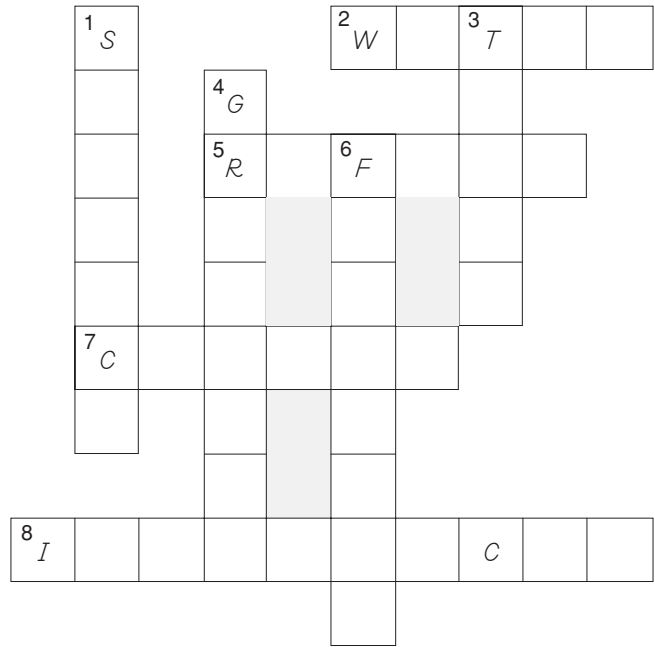
Use the clues to help you solve the crossword puzzle. Answers are words from the reading.

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

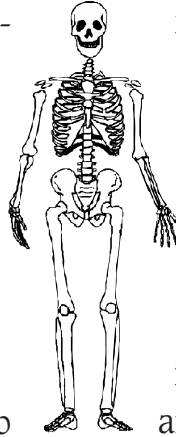
Add vowels (*a, e, i, o, u*) to complete the words from the reading.

1. __nd__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__ __ght and __n__rgy 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).

SELS _____	OMANUT _____
ADED _____	TRUERACES _____
SYBU _____	NETFO _____
RAPT _____	LIARMEAT _____

- | | |
|-------------------|----------------------|
| 1. piece _____ | 5. deceased _____ |
| 2. quantity _____ | 6. frequently _____ |
| 3. fewer _____ | 7. industrious _____ |
| 4. beings _____ | 8. substance _____ |

SENTENCE COMPLETION

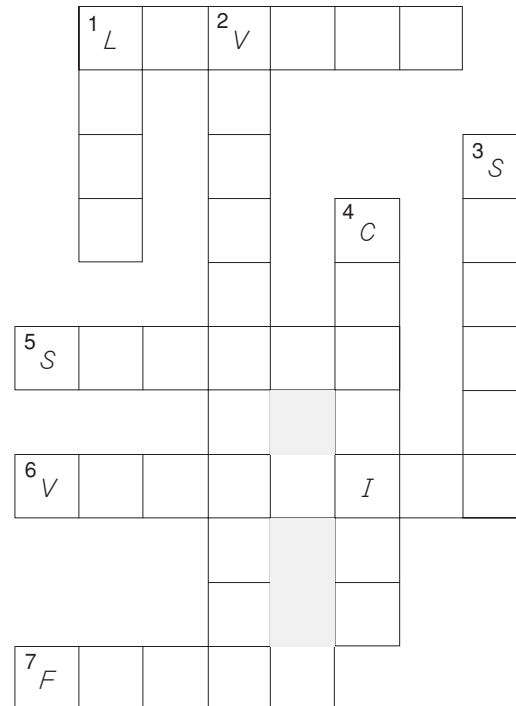
Puzzle answers are words from the reading that complete the sentences.

ACROSS

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

DOWN

- Fossils are the remains of _____ dead creatures.
- Fossils tell us about the history of _____.
- The bones of the spine and hip have a _____ texture.
- 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

Science in the News: A Very Long-Term Experiment



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”?

p _____

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

g _____

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

e _____

ANTONYMS

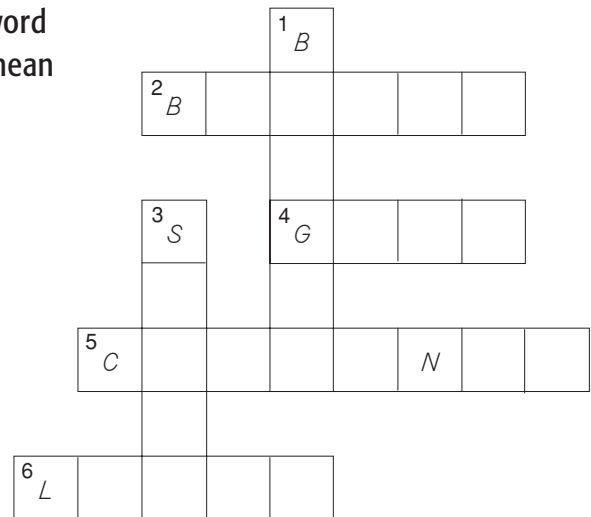
Use words from the reading to solve the crossword puzzle. Clue words are *antonyms* (words that mean the opposite) of the answer words.

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).

DISCBREED _____	RINWOLFEG _____
NEATIMERG _____	NEXTED _____
CRIEDEDT _____	EDSIVED _____

- | | |
|-------------------|------------------------|
| 1. blooming _____ | 4. ordered _____ |
| 2. invented _____ | 5. lengthen _____ |
| 3. sprout _____ | 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.

-ist

-ian

-ant

-or

-er

-ar

-ent

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

Analogies are statements 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.

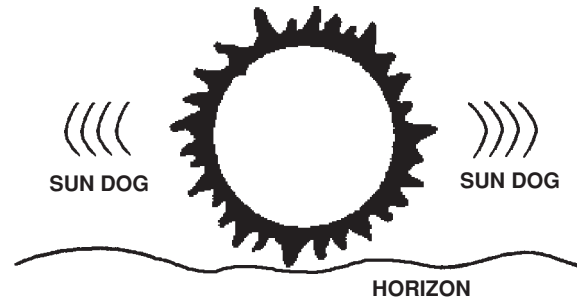
1. *Baby* is to *child* as seed is to s_____.
2. *Sweet* is to *taste* as y_____ is to *color*.
3. *Disappear* is to *vanish* as r_____ is to *stay*.
4. *Hours* are to *minutes* as y_____ are to *months*.
5. G_____ is to *bottle* as *tin* is to *can*.
6. *Run* is to *ran* as *dig* is to d_____.
7. *Water* is to *fish* as *soil* is to p_____.

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”?

c _____

2. What four-letter noun in the reading names a unit of time?

h _____

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

g _____

SYNONYMS

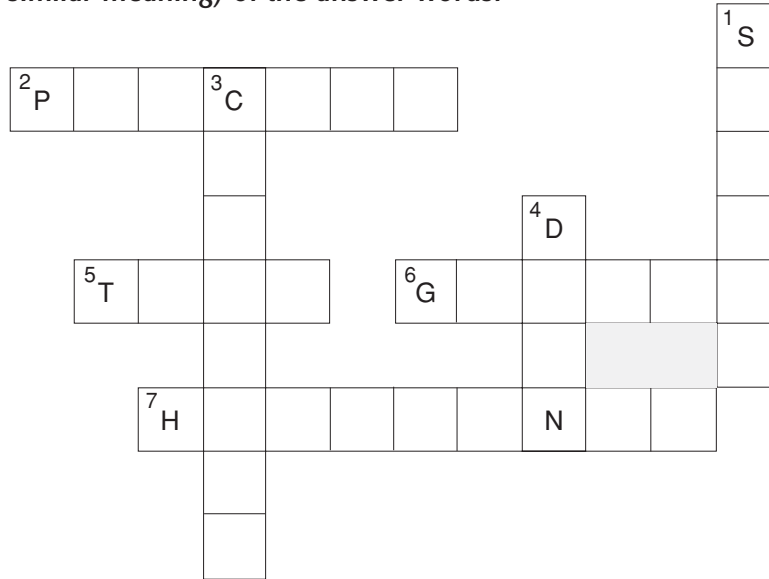
Complete the puzzle with words from the reading. Clue words are *synonyms* (words with a similar meaning) of the answer words.

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. SCARTSLY _____: 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

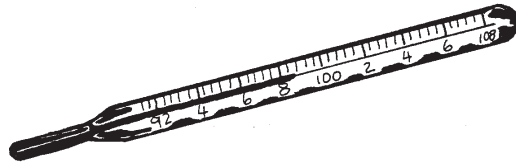
You can change the *form* of many words to make different parts of speech. The verb *excite*, for example, can be changed to the adjective *exciting*, or the noun *excitement*. Change the form of each **boldface** word from the reading according to the directions below. The first one has been done for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

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”?

d

e

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”?

g_____

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”?

l_____

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 a ___ 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).

MUPD _____	NUQUIE _____
SHART _____	GALLILE _____

- | | |
|--------------------|-------------------|
| 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

REVIEW

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 c _____.
2. *Slender* is to *chubby* as i _____ is to *lazy*.
3. *Page* is to *chapter* as *bit* is to h _____.
4. *Horizontal* is to *horizontally* as v _____ is to *vertically*.
5. *Steak* is to *protein* as *pasta* is to c _____.
6. *Off-* is to "away from" as i _____ 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



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

PREVIEW

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. __xt__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 __bs__rv__.
4. The bowhead whale is an __nd__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 *theorys*.
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
TRUE OR FALSE: 1. T 2. F 3. T 4. T 5. F 6. F 7. T

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*.

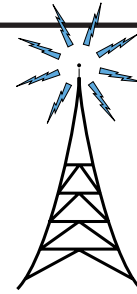
1. (**evaporation**) On a sunny day, water in a puddle will _____ quickly.
2. (**extinct**) Mass _____ occurs when many forms of life suddenly disappear from the Earth.
3. (**environment**) _____ are those who work to protect Earth's air and water from pollution.
4. (**condensation**) Freezing temperatures _____ 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
c _____.
2. *Past* is to *present* as
e _____
is to *living*.
3. *Daisy* is to *flower* as *sleet*
is to *p* _____.
4. *Venus* is to *planet* as *moon*
is to *s* _____.
5. *Environment* is to
environmental as *continent*
is to *c* _____.
6. *Circulation* is to *circulatory*
as *r* _____
is to *respiratory*.

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

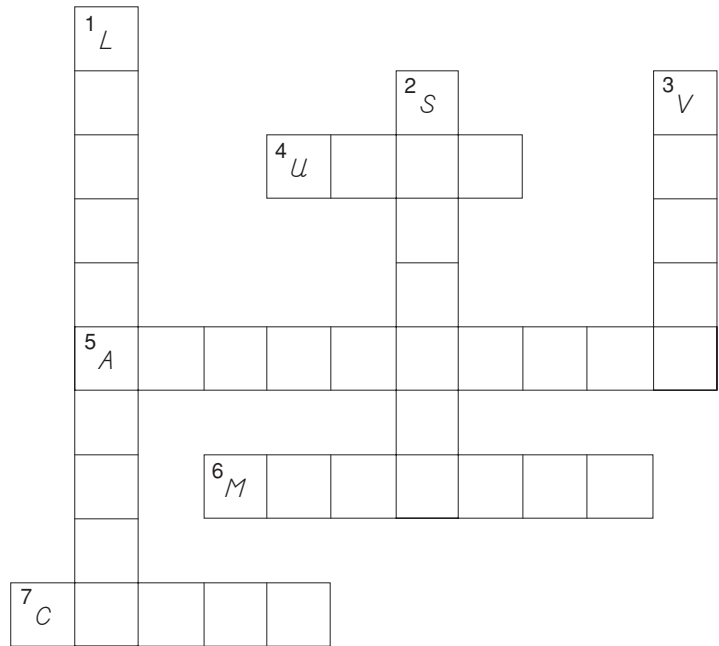
1. What six-letter noun in the reading means “the power of certain forces of nature to do work”? *e* _____
2. What nine-letter noun in the reading means “a device for sending messages by a code of electrical signals”? *t* _____
3. What nine-letter noun in the reading means “a scientist who studies the interrelationships of matter, energy, force, and motion”? *p* _____

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. megahertz = MHz
2. hertz = _____
3. kilohertz = _____
4. _____ = ft.
5. gallon = _____
6. _____ = min.
7. _____ = oz.
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 |

What Causes Precipitation?

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.

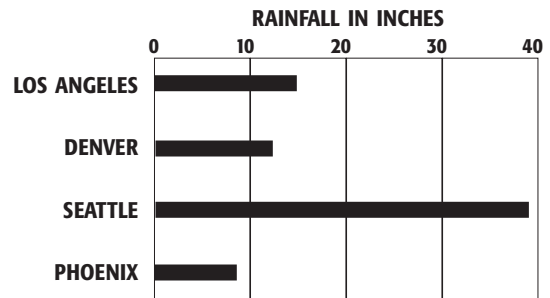
In the United States, most precipitation-producing weather systems come from the west. These systems are carried along by undulations in the polar jet stream. The jet stream is stronger in higher latitudes, bringing more storms to northern locales.

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.

**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"?

*e**r**d*

ANTONYMS

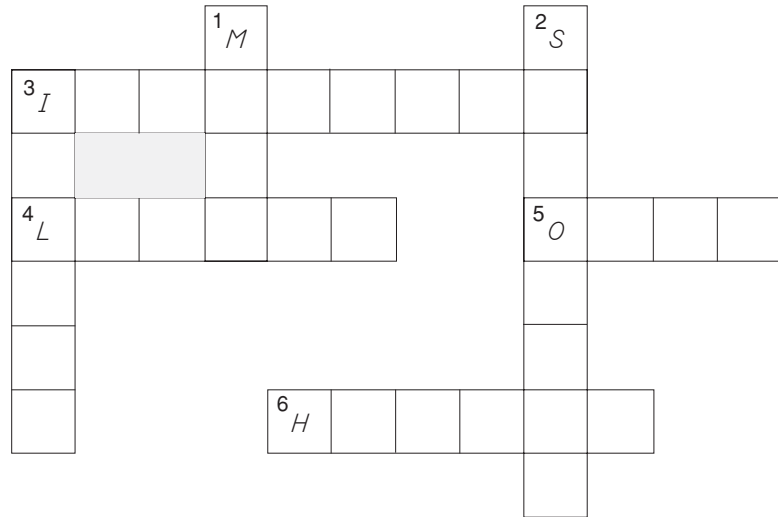
Solve the crossword puzzle. Clues are *antonyms* (words with opposite meanings) of words from the reading.

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 l_____.
2. *Numerous* is to *plentiful* as *yearly* is to a_____.
3. *Warmer* is to *rain* as *colder* is to s_____.
4. *Mountain* is to *mountainous* as *pole* is to p_____.

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 _____.

Try It Yourself: Make a Standing Wave

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 plastic bottle of water
- a small cloth such as a dish towel
- 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? p

3. What seven-letter adjective in the reading means “more than two but not many”? 1

SYNONYMS

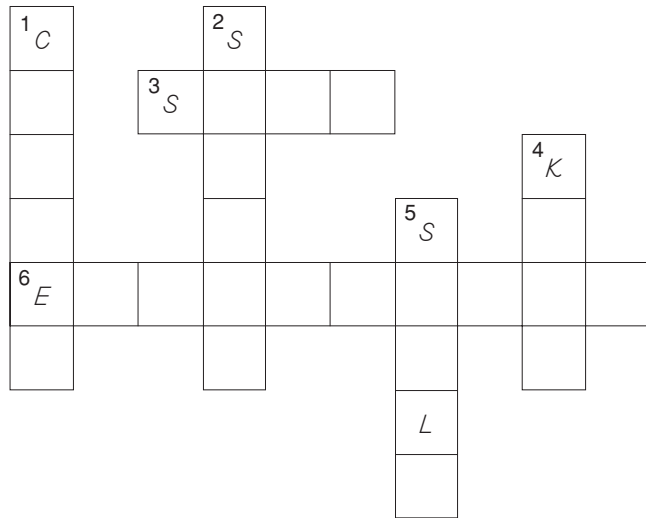
Complete the crossword puzzle with words from the reading. The clue words are *synonyms* (words with a similar meaning) of the answers.

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 works b. conducts surgery c. manages or controls
4. A RENTTAP _____ of rings will appear on the
water's surface.
- a. planned route b. guide for making something c. visible design

ANTONYMS

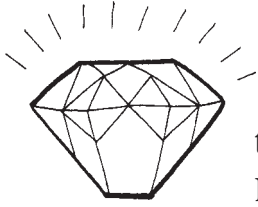
Write a letter to match each word from the reading with its *antonym* (word with the opposite meaning).

- | | |
|--------------------|------------------|
| 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 |

Carbon: A Common Element

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”?

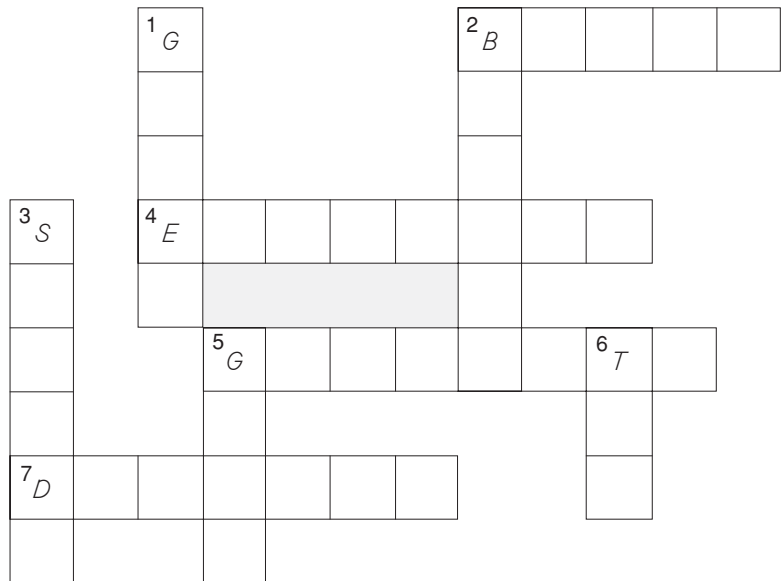
c _____

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

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. form of matter
including oxygen
(plural) 2. a division or part of 3. form of matter including
iron (plural) | <ol style="list-style-type: none"> 5. precious jewels 6. lightweight metal used to
make cans |
|--|--|

SYNONYMS

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

TRIPEROPES _____	ROMF _____
DUMSCOONP _____	SEERAG _____

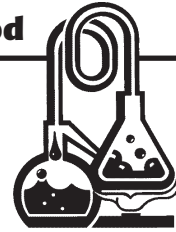
1. *kind, type,*

3. *to oil, lubricate,*

2. *qualities, characteristics,*

4. *mixtures, combinations,*

In Pursuit of Knowledge: The Scientific Method



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”? u
2. What eight-letter noun from the reading means “a written record that proves something”? d
3. What eleven-letter noun in the reading means “careful examination and study of something”? e

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.)

problem	percent	study	subject	conduct
document	solve	proof	time	test
experiment	state	learn	basis	reading
determine	observe	step	lead	results

- 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

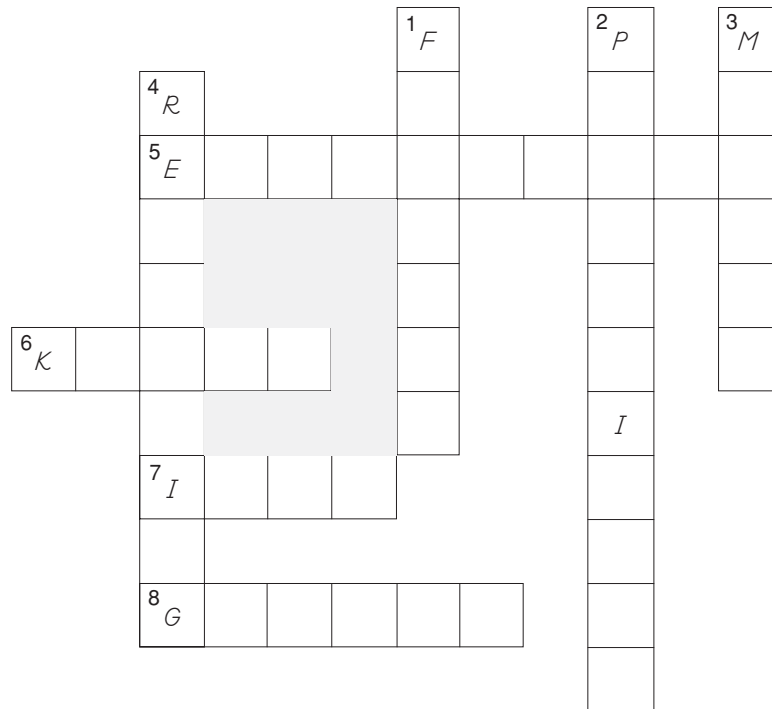
Use words from the reading to complete the crossword puzzle. Clue words are *synonyms* (words with a similar meaning) of the answer words.

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).

HOOLOGYHUG _____

TURIPUS _____

GELEDWONK _____

ADLE _____

1. haphazardly / _____

2. follow / _____

3. avoidance / _____

4. ignorance / _____

Science in the News: Rewriting the Record Books

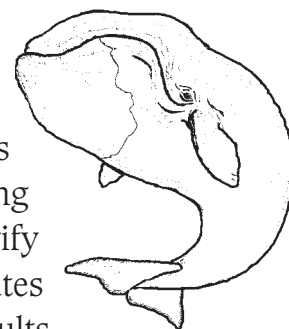
Until now, scientists thought that bowhead whales had a longevity of 80 to 100 years—about the same as humans. But that was before the Inupiat people of northern Alaska discovered evidence to the contrary. After recent hunts, they found six ancient ivory and stone harpoon points embedded in the blubber 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”?
2. What seven-letter noun in the reading names a kind of weapon?
3. What seven-letter plural noun in the reading means “warm-blooded animals with backbones”?

l _____

h _____

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 _____
RIVFEY _____	EROWL _____

1. *southern* _____
2. *upper* _____
3. *unsurprised* _____
4. *disprove* _____
5. *modern* _____
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; dignified
 - b. different in every whale
 - c. conspicuous; distinct
2. The Inupiats discovered evidence **to the contrary**.
 - a. that discredited earlier evidence
 - b. that raised another issue
 - c. stubbornly 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 _____ *whales* _____
2. forth _____
3. steal _____
4. sees _____
5. inn _____
6. bare _____

SYNONYMS

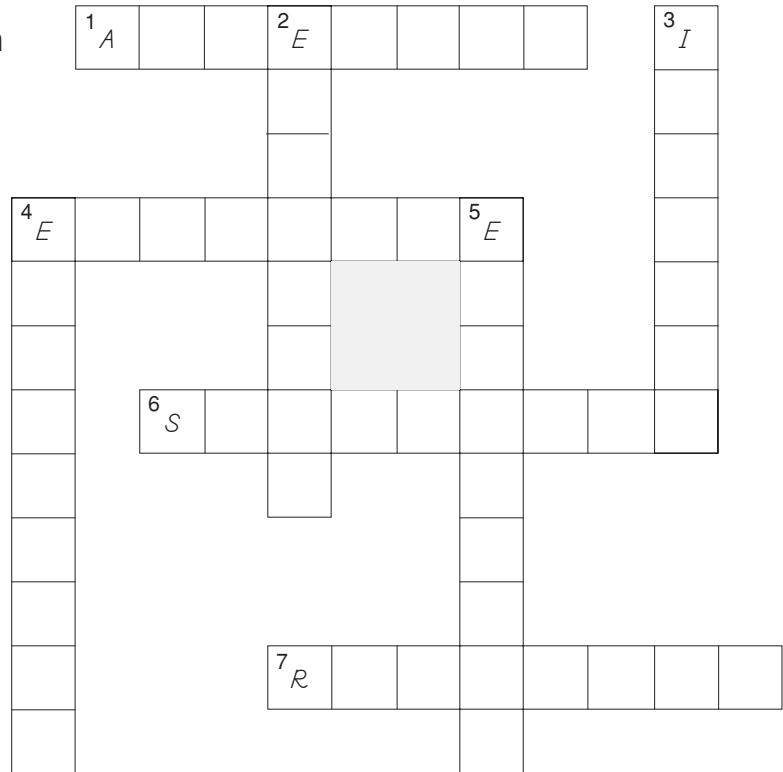
Complete the crossword puzzle.
Clues are *synonyms* (words with a similar meaning) of words from the story.

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.

REVIEW

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 c_____.
2. *Cold* is to *condensation* as *warmth* is to e_____.
3. *Rise* is to *evaporation* as *fall* is to p_____.
4. *Abbreviation* is to *Mr.* as *kHz* is to k_____.
5. *Extinct* is to *living* as *cold-blooded* is to w_____.
6. *Weight* is to *pound* as *energy wave* is to h_____.

PREVIEW

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 navagate

3. aproppriate substitute appropriate substatute

4. studios amplafied studioes amplified

ANSWERS: RECOGNIZING EXAMPLES: 1. Hispanic, Shakespearean 2. frequencies, fungi 3. broadcasting, snowflake
4. unforgivable, disjointed 5. moldy, hairless SPELLING: 1. modems, inventor 2. navigate, rhinoceros
3. substitute, appropriate 4. studios, amplified

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.

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

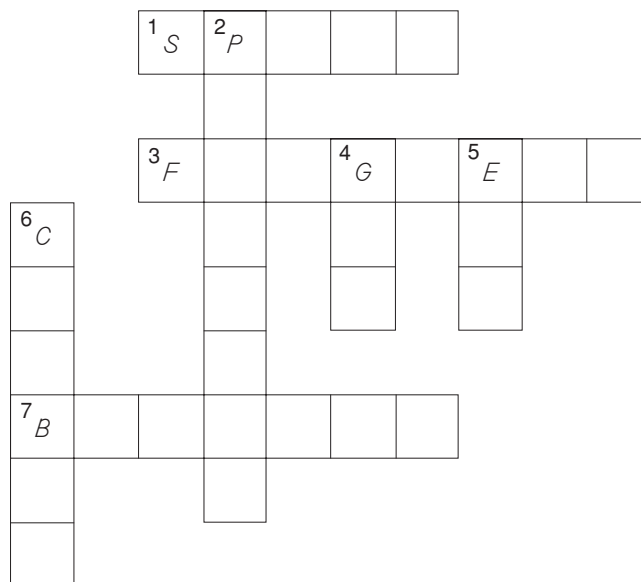
Use clues to help you complete the crossword puzzle. Answers are words from the reading.

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 _____ |

Today's Weather Forecast: A National Overview

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**ATLANTA**

Rain showers changing to ice and snow; increasing clouds; high 45°, low 28°

SEATTLE

Intermittent showers until noon, then mostly sunny; high 45°, low 39°

KANSAS CITY

Overcast in the morning, sunny in the afternoon; high 30°, low 10°

DETROIT

Consistent light flurries throughout the day; high 25°, low 5°

WORD SEARCH

1. What twelve-letter adjective in the reading means "stopping and starting again from time to time"?

i _____

2. What eight-letter plural noun in the reading means “sudden light falls of snow or rain”? f

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

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: _____

SYNONYMS

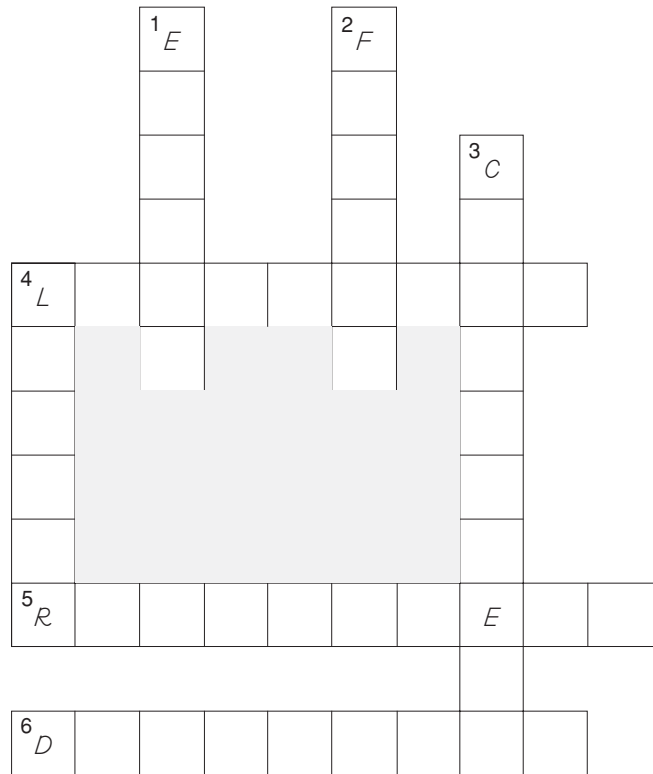
Complete the puzzle with words from the reading. Clues are *synonyms* (words with a similar meaning) of the answer words.

ACROSS

- places; perhaps cities
- persistent; unyielding
- to break up; disappear

DOWN

- to foresee; anticipate
- freezing; bitterly cold
- steady; unchanging
- to remain; continue

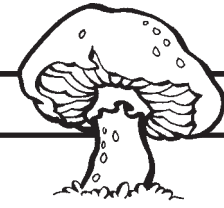


ANTONYMS

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.

- some **extreme** northern locations
 - slightly
 - remote
 - unusual
- will be fairly **chilly**
 - windy
 - uncomfortable
 - sweltering
- snow will **continue**
 - cease
 - develop
 - proceed
- increasing** clouds
 - darkening
 - diminishing
 - fluffier

Try It Yourself: Making Mold



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”? e
2. What five-letter proper noun in the reading names a planet? E
3. What seven-letter noun in the reading means “in biology, one of the major groups into which all living things are divided”? k

4. What nine-letter plural noun in the reading names a kind of edible fungi that have a stalk and a cap?

m_____

ANTONYMS

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

NYNUS _____	GEMTINE _____
MAPD _____	REPAPA _____
UZZFY _____	LUFL _____
HEWIT _____	GINFYAM _____

- | | |
|-------------------|---------------------|
| 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

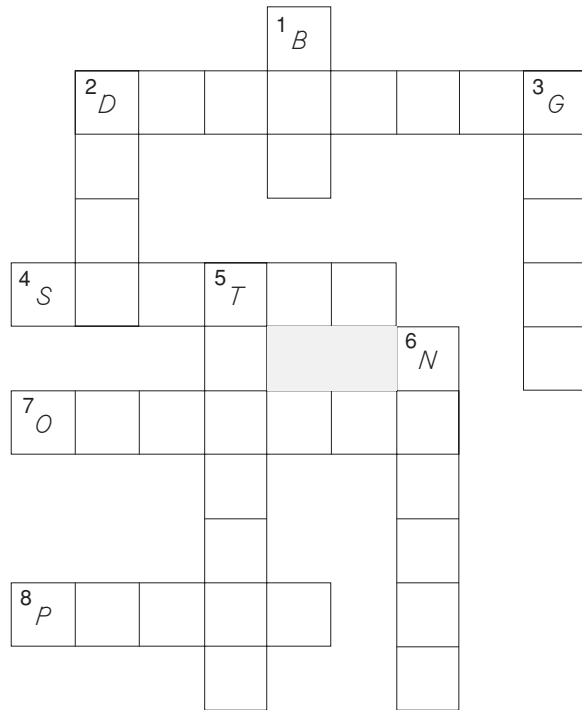
Complete the puzzle with words from the reading. Clues are *synonyms* (words with a similar meaning) of the answer words.

ACROSS

2. rotting
4. a drawing
7. to watch
8. a vegetable

DOWN

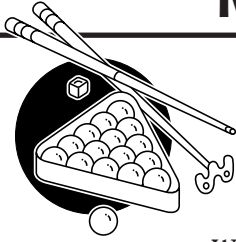
1. a sack
2. dim
3. thrives
5. swarming
6. almost



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 f_____.
2. *Alike* is to *unlike* as *same* is to d_____.
3. *Natural* is to *cotton* as *manmade* is to p_____.
4. *Ledge* is to *window sill* as *cupboard* is to c_____.
5. *Organize* is to *organization* as *classify* is to c_____.
6. *Plants* is to *plant* as *fungi* is to f_____.
7. *General* is to *specific* as *scientist* is to h_____.
8. *Either* is to *or* as *neither* is to n_____.

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”?

g _____

2. What seven-letter verb in the reading means “to move from one region to another with the change of seasons”?

m_____

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

s_____

WORD FORMS

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

APPLY	INVESTIGATE
PAST-TENSE VERB: _____	PAST-TENSE VERB: _____
NOUN FORM: _____	NOUN FORM: _____
ONE WHO DOES: _____	ONE WHO DOES: _____

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

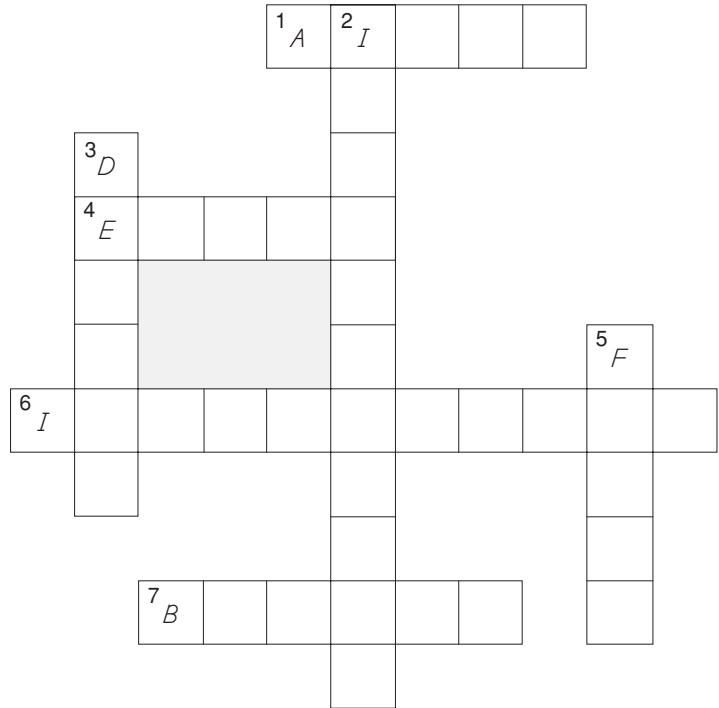
Complete the crossword puzzle with words from the reading. Clue words are *synonyms* (words with a similar meaning) of the answer words.

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**

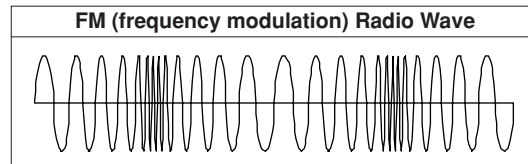
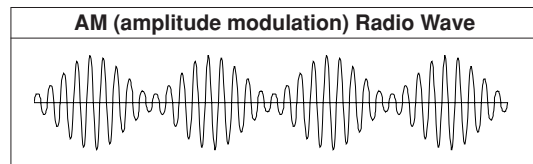
f. imprecise

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”?

transistors

radio stations

3. What five-letter adjective in the reading means “made of a chemical—such as iron, gold, or aluminum—that conducts electricity”?

m

ANTONYMS

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

- Nearby** radio stations fill the air around you with radio frequency waves.
a. overlapping b. faraway c. powerful
- In order to operate the loudspeaker, the program current must be **amplified**.
a. ignited b. refined c. silenced
- The tuner selects the frequency of the **desired** station.
a. best b. unwanted c. chosen
- 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. <i>Tongue</i> is to <i>taste</i>
as <i>ear</i> is to
<u>h</u> _____. | 3. <i>Copy</i> is to <i>copies</i>
as <i>frequency</i> is to
<u>f</u> _____. |
| 2. <i>Celebrate</i> is to <i>celebration</i>
as <i>vibrate</i> is to
<u>v</u> _____. | 4. <i>Gather</i> is to <i>scatter</i>
as <i>combine</i> is to
<u>s</u> _____. |

SYNONYMS

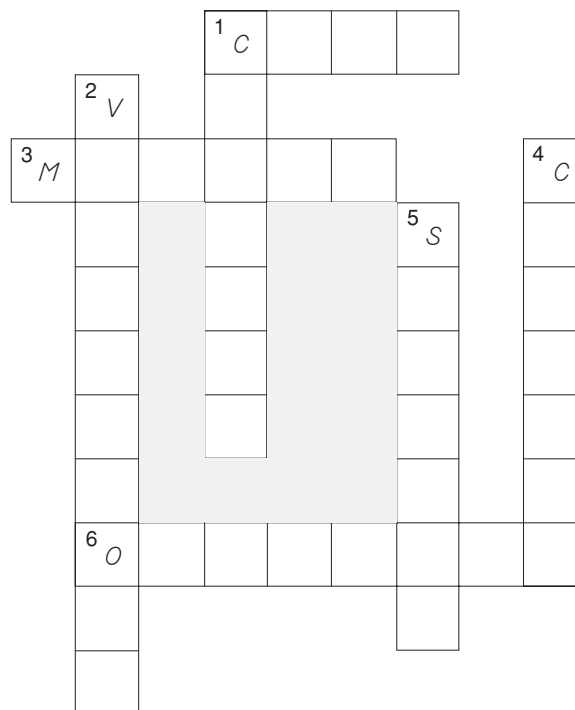
Use the clues to help you solve the crossword puzzle. Clues are *synonyms* (words with a similar meanings) of words from the reading.

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.

The Amazing Rhino

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 $62\frac{1}{2}$ 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”?

1 _____

2. What seven-letter adjective in the reading means “of the same family or kind”?

2 _____

3. What eight-letter plural noun in the reading means “openings in the nose through which people and some animals breathe and smell”?

nostrils

ANTONYMS

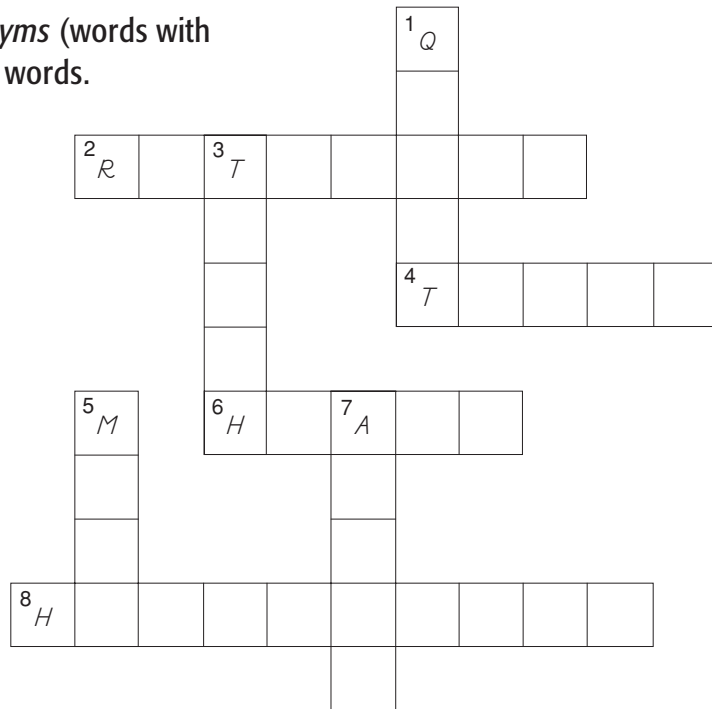
Complete the crossword puzzle with words from the reading. Clue words are *antonyms* (words with opposite meanings) of the answer words. Use a dictionary if you need help.

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 payment
 - b. launch a running attack
 - c. take bounding 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.

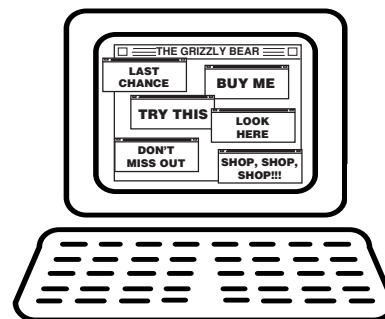
3. The rhino’s ROTPACS _____ were careful not to injure the animal.

Science in the News: Avoiding Potholes on the Information Highway

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:

- **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.
- **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.



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”?

m _____

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”? l_____

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

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

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. <i>Portrait</i> is to <i>artist</i>
as <i>book</i> is to
<u>a</u> _____. | 5. <i>Scissors</i> is to <i>divide</i>
as <i>modems</i> are to
<u>c</u> _____. |
| 2. <i>Potholes</i> are to <i>highway</i>
as <i>problems</i> are to
<u>l</u> _____. | 6. <i>Music</i> is to <i>musician</i>
as <i>library</i> is to
<u>l</u> _____. |
| 3. <i>Present</i> is to <i>past</i>
as <i>current</i> is to
<u>f</u> _____. | 7. <i>Esteemed</i> is to <i>reputable</i>
as <i>worth</i> is to
<u>v</u> _____. |
| 4. <i>Bear</i> is to <i>bare</i>
as <i>sight</i> is to
<u>s</u> _____. | 8. <i>Adjective</i> is to <i>adverb</i>
as <i>important</i> is to
<u>i</u> _____. |

SYNONYMS

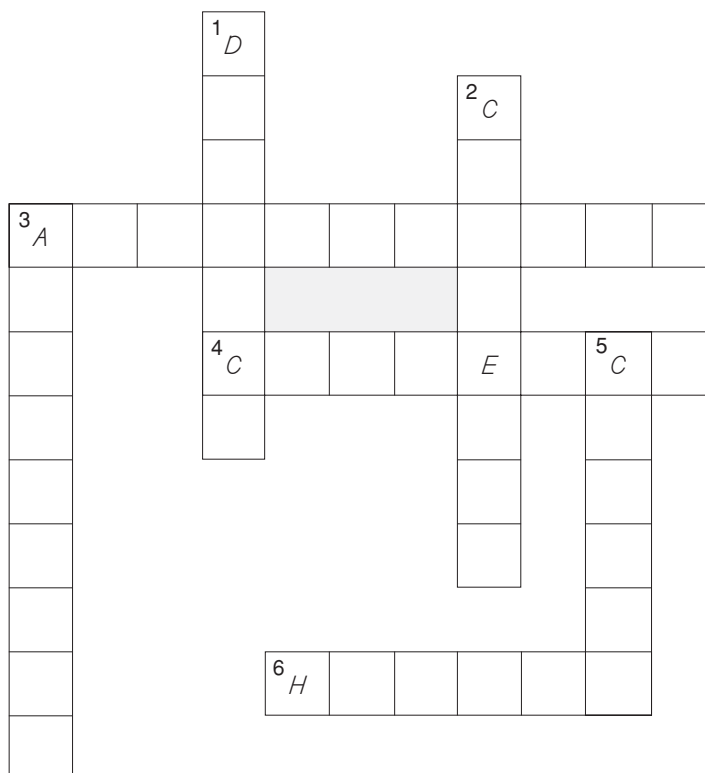
Complete the puzzle with words from the reading. Clue words are *synonyms* (words with a similar meaning) of the answer words.

ACROSS

3. suitable
4. recency; newness
6. assisted

DOWN

1. to devalue
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.

wastefully	questionable	intolerable	concise	soothing
-------------------	---------------------	--------------------	----------------	-----------------

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 _____. _____

REVIEW

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
- _____ THEORY
- _____ EXACT
- _____ QUEST
- _____ WAVES
- _____ MASSES
- _____ GENETICS
- _____ PARTICLE
- _____ CONSISTENT
- _____ FRIGID
- _____ MOLD
- _____ FUZZY

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
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

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

Analogies are 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
f _____.

4. *Singular* is to *plural*
as *chromosome* is to
c _____.

2. *Sea* is to *oceanography*
as *earth* is to
g _____.

5. *Male* is to *female*
as *sperm* is to
e _____.

3. *Radio waves* are to *antenna*
as *sound waves* are to
l _____.

6. *Occasional* is to *steady*
as *intermittent* is to
c _____.

PREVIEW

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

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.

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. <i>Keyboard</i> is to <i>printer</i>
as <i>input</i> is to
<u>o</u> _____. | 4. <i>Plants</i> are to <i>producers</i>
as <i>animals</i> are to
<u>c</u> _____. |
| 2. <i>Total</i> is to <i>partial</i>
as <i>erosion</i> is to
<u>w</u> _____. | 5. <i>Flower</i> is to <i>botany</i>
as <i>planet</i> is to
<u>a</u> _____. |
| 3. <i>Wind</i> is to <i>windmill</i>
as <i>fluid</i> is to
<u>t</u> _____. | 6. <i>Meat</i> is to <i>protein</i>
as <i>doughnut</i> is to
<u>c</u> _____. |

CATEGORIES

Write the boxed items under the correct headings.

desert	bread	quartz	monitor
fruits	ocean	printer	rain forest
silver	noodles	zinc	disk drive

1. HABITATS

3. COMPUTER OUTPUT DEVICES

2. CARBOHYDRATES

4. MINERALS

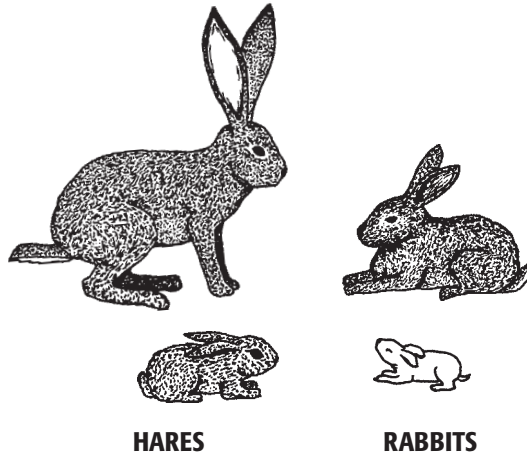
Rabbits and Hares: What's the Difference?

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”?

r _____

h _____

3. Which seven-letter plural noun in the reading means “underground holes or tunnels”?

h _____

ANTONYMS

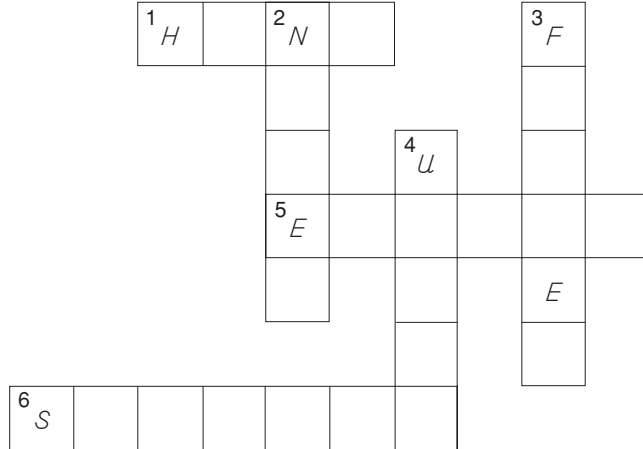
Complete the crossword puzzle with words from the reading. Clues are *antonyms* (words that mean the opposite) of the answer words.

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).

WOLPRUFE _____	DERENT _____
BUSBYT _____	LUAUSLY _____
SAICFIELDS _____	AKEIL _____

- 1. similar / _____
- 4. ordinarily / _____
- 2. soft / _____
- 5. mighty / _____
- 3. short / _____
- 6. categorized / _____

CATEGORIES

List each word in the box under the correct heading.

newborn	underground	helpless	longer	vegetarian	cottontail
----------------	--------------------	-----------------	---------------	-------------------	-------------------

1. COMPOUND WORDS

2. WORDS WITH SUFFIXES

HOMONYMS

Homonyms 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

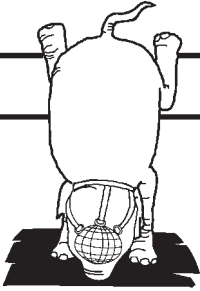
The hair on that hare is a beautiful brown color.

2. **pairs** / _____

3. **bear** / _____

4. **tails** / _____

5. **two** / _____



Animal Intelligence

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”?

i _____

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

c _____

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

m _____

SYNONYMS

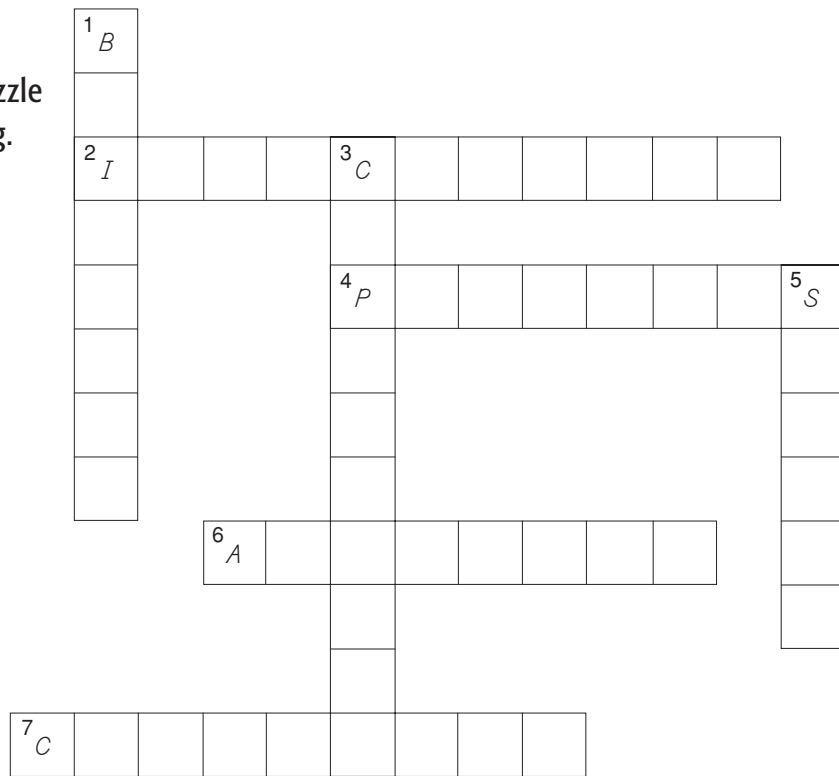
Complete the crossword puzzle with words from the reading. Clues are *synonyms* (words with a similar meaning) of the answer words.

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.

VERBS	NOUNS
1. recognize	
2.	colony
3. measure	
4. perform	
5.	memory
6. solve	

ANTONYMS

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

DRAWER _____	INVALIDUDI _____
ROPERIUS _____	SCANTIGAFIN _____

1. boring / _____ 3. inferior / _____
2. group / _____ 4. punishment / _____

WORDS IN CONTEXT

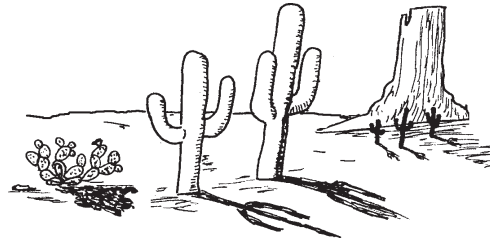
Circle a letter to show the meaning of the **boldface** word or words.

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 and react to b. give intelligent answers to c. try to please and impress

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”?

p _____

2. What ten-letter noun in the reading means “a certain part or amount in every hundred”?

p _____

3. What seven-letter verb in the reading means “goes beyond what is usual or allowed”?

e_____

ANTONYMS

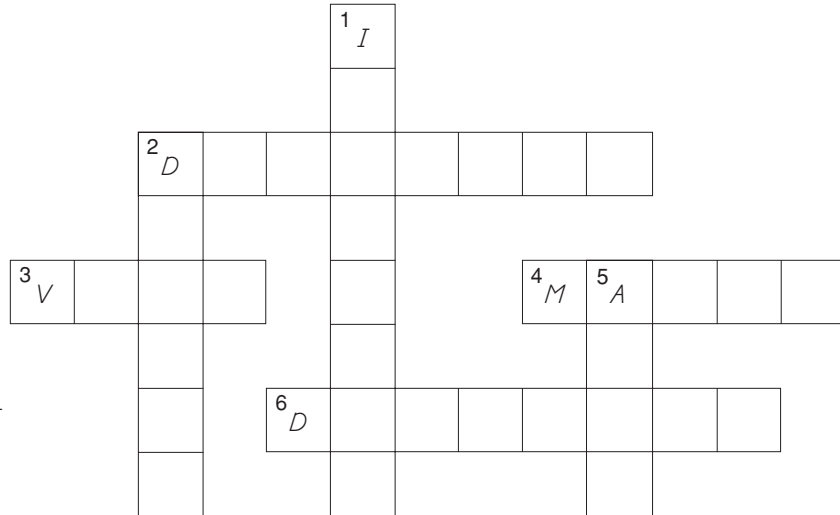
Complete the crossword puzzle with words from the reading. Clues are *antonyms* (words that mean the opposite) of the answer words.

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 |

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
- <http://mathforum.com/dr.math>
Dr. Math accepts math challenges.

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”?

 r _____

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

 e _____

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

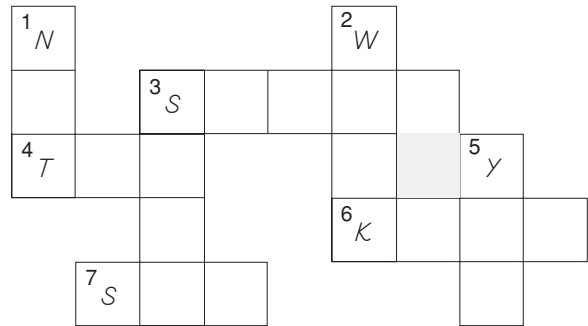
Homonyms are words that sound alike but have different meanings and sometimes different spellings. Clue words are homonyms of words from the reading. Use words from the reading to complete the crossword puzzle.

ACROSS

3. sights
4. to
6. no
7. sea

DOWN

1. knot
2. weak
3. sum
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. <i>Gymnasium</i> is to <i>gym</i>
as <i>mathematics</i> is to _____. | 3. <i>Money</i> is to <i>budget</i>
as <i>time</i> is to _____. |
| 2. <i>Later</i> is to <i>subsequently</i>
as <i>earlier</i> is to _____. | 4. <i>Send</i> is to <i>submit</i>
as <i>reply</i> is to _____. |

Science in the News: Monitoring Vesuvius

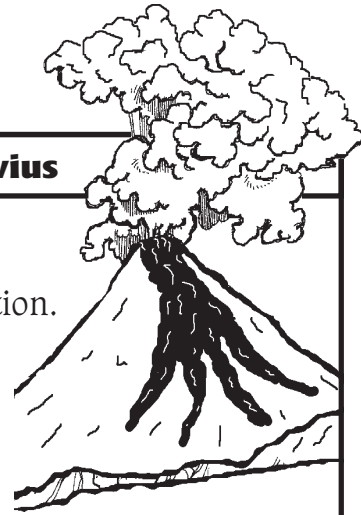
Scientists agree about one thing: The world's most famous volcano will erupt again. The only active volcano on the mainland of Europe, Vesuvius is currently the subject of a bitter dispute. One volcanologist says that state-of-the-art equipment will give two or three weeks' warning before a major eruption 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? volcanologists
2. What seven-letter adjective in the reading describes an effect “caused by an earthquake or explosion”? catastrophic

3. What seven-letter adjective in the reading describes something that comes into sight in a sudden, frightening way? **l** _____

ANTONYMS

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

1. **SUMOAF**

_____ / unknown

4. **PINTONIP**

_____ / guess

2. **TONGRINIOM**

_____ / ignoring

5. **TICAVE**

_____ / extinct

3. **NYCETRIAL**

_____ / doubtfully

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

Grid details:

- 1 Down: (1,7) S
- 2 Down: (2,2) P
- 3 Across: (3,5) D, (4,5) I
- 4 Down: (4,2) I
- 5 Across: (5,5) E
- 6 Across: (6,2) E
- 7 Down: (7,10) S
- 8 Across: (8,2) T, (8,9) D

WORDS IN CONTEXT

Circle a letter to show the meaning of the **boldface** words. If you need help, check a dictionary.

- Lava and burning ashes **cascaded** down the mountain.
 - exploded in all directions
 - quickly flowed in large amounts
 - mushroomed in a dark cloud
- Would residents have enough time to **evacuate**?
 - immediately leave for safety's sake
 - board up their homes
 - evaporate the hot lava
- Can **state-of-the-art** equipment warn of an eruption?
 - finest instruments in the state
 - artistic renderings
 - most advanced technology
- Convulsive** waves of lava completely buried Pompeii.
 - curving outward, not inward
 - uncontrollably jerky and shaky
 - very dense and heavy
- On the **mainland** of Europe, Vesuvius is the only active volcano.
 - not an island or a peninsula
 - most important region
 - centrally 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.

ADJECTIVE FORM

NOUN FORM

- | | |
|-----------------------------|------------------------|
| 1. volcano _____ | 1. active _____ |
| 2. catastrophe _____ | 2. erupt _____ |
| 3. disaster _____ | 3. occur _____ |

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”?

i _____

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

c _____

3. What nine-letter noun in the reading means “corrupted condition caused by an outside influence”?

p _____

4. What six-letter plural noun in the reading means “bodily fibers that connect organs, muscles, etc. to the brain and spinal cord”?

n_____

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

3. **IOURSSE**

_____ / severe

2. **ARKEB**

_____ / rupture

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. <i>Fahrenheit</i> is to <i>F</i>
as <i>decibel</i> is to
<u>d</u> _____. | 4. <i>Effect</i> is to <i>cause</i>
as <i>flood</i> is to
<u>r</u> _____. |
| 2. <i>Damage</i> is to <i>injury</i>
as <i>strain</i> is to
<u>s</u> _____. | 5. <i>Soft</i> is to <i>whisper</i>
as <i>loud</i> is to
<u>s</u> _____. |
| 3. <i>Finger</i> is to <i>knuckle</i>
as <i>ear</i> is to
<u>e</u> _____. | 6. <i>Adjective</i> is to <i>noun</i>
as <i>intense</i> is to
<u>i</u> _____. |

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.
7. A p__rm__n__nt disability never goes away.

REVIEW

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 |

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

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** _____

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
l _____.

4. *Much* is to *little*
as *loud* is to
f _____.

2. *Explode* is to *explosion*
as *erupt* is to
e _____.

5. *Sound* is to *homonyms*
as *meaning* is to
s _____.

3. *Yesterday* is to *outdated*
as *now* is to
y _____.

6. *Lion* is to *consumer*
as *dandelion* is to
p _____.

END-OF-BOOK TEST

ELEMENTS OF VOCABULARY

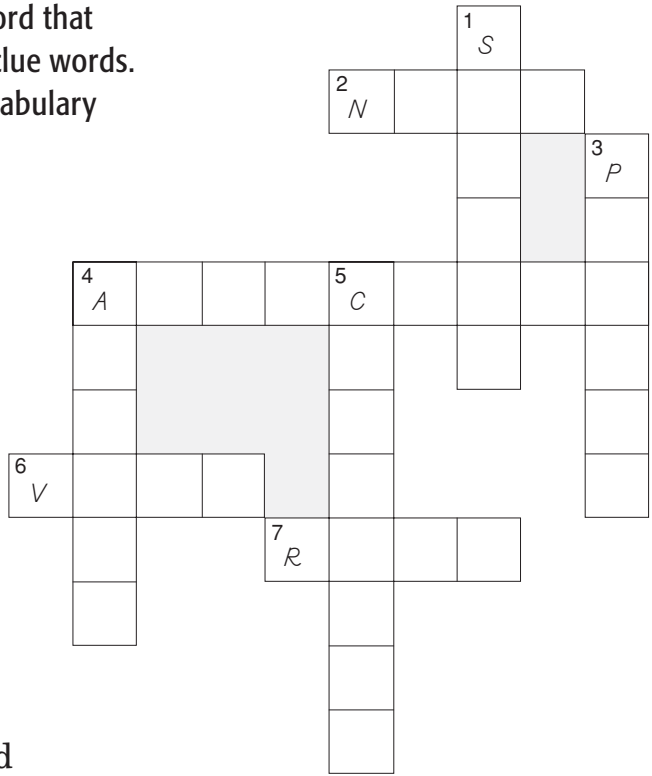
- Complete the crossword puzzle with a word that names the category that could label the clue words. Answers are some of the elements of vocabulary you've been working with in this book.

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: _____

5. ELEMENT: _____
 EXAMPLES: _____
6. ELEMENT: _____
 EXAMPLES: _____
7. ELEMENT: _____
 EXAMPLES: _____
8. 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	<u>son</u>	<u>her oldest, tallest son</u>
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 | 4. bacterium | 7. memory |
| _____ | _____ | _____ |
| 2. fungus | 5. alley | 8. flurry |
| _____ | _____ | _____ |
| 3. species | 6. criterion | 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**

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

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.

DROOLBETAMS _____	NAILMAND _____
GLINTHUS _____	THAWGENVEL _____

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.

WORD LIST

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 alleys
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

WORD LIST

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

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

WORD LIST

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

VOCABULARY
in context

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



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