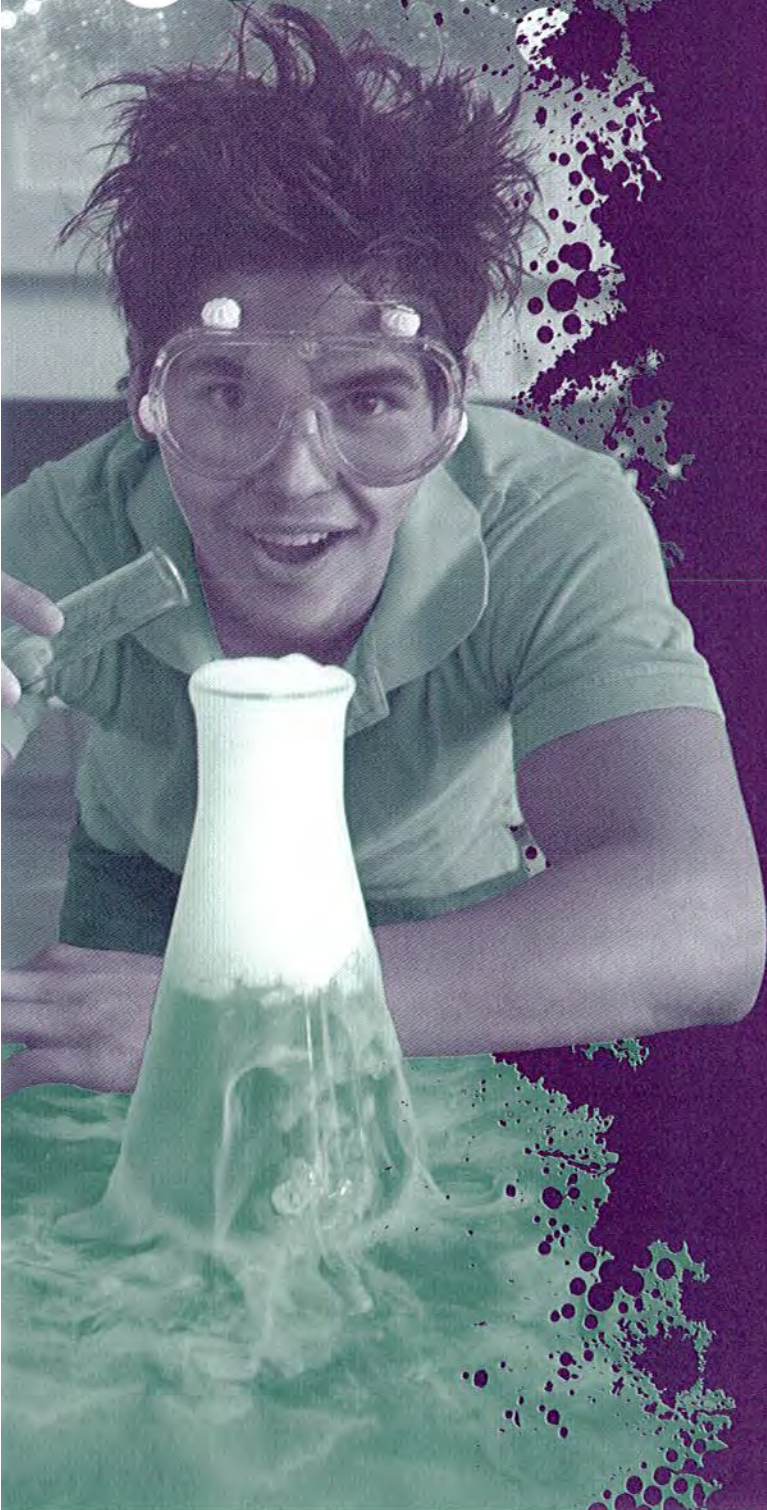


It's Elemental!



LESSON

7

Do Cereals Really Contain Iron?

Science reveals the truth about "iron-fortified" cereal.

clarify intensify representation
 diversify phenomenon signify
 domain precede tangible
 element

LESSON

8

Two-Time Nobel Prize Winner Dies

Marie Curie's study of radioactivity changed the world.

advocate interval radioactive
 civil nuclear succession
 civilian particles welfare
 innovation

LESSON

9

The Tennessee Coal Ash Case

Coal ash spills must be stopped.

differentiate properties sinister
 endeavor protocols status
 professional remedy tolerate
 prohibit

Do Cereals Really Contain Iron?

<science experiment summary>



Sitting at breakfast one morning, I noticed the words “Iron-Fortified” in big letters on the Iron Crunch Cereal box. Iron consumed in foods helps the body form hemoglobin, a substance in the blood. Thus, having sufficient iron can intensify the amount of oxygen that is delivered throughout the body. However, other than the words on the box, there was nothing to signify that the cereal inside actually contained iron. I decided to do an experiment to confirm whether iron, the fourth most common element on Earth, was actually an

ingredient. The following is a summary of the experiment “Iron-Fortified Cereal: Myth or Truth?” which I conducted for the science fair.

The guiding hypothesis for the experiment was that any iron bits contained in the cereal would be attracted to a magnet. A magnet is a piece of metal that creates magnetic fields, and it’s this phenomenon that causes the magnet to attract metallic substances like iron.

The materials used in the experiment were a bowl of Iron Crunch Cereal, water, and a strong magnet. First, I mixed the cereal with water to create a thin, wet mixture, or slurry. Then I placed the magnet in the slurry. For five minutes, I moved the magnet in circles through the slurry. I then removed the magnet to study it. I had to precede this step with a good shake to clean the slurry from the magnet.

The findings? The magnet was covered with clumps of tiny iron bits. The iron was not visible or tangible, however, until the magnet extracted the bits from the slurry. Their presence on the magnet helped to clarify rather than confuse the fact that there was, in fact,

VOCABULARY

intensify	tangible
signify	clarify
element	representation
phenomenon	diversify
precede	domain

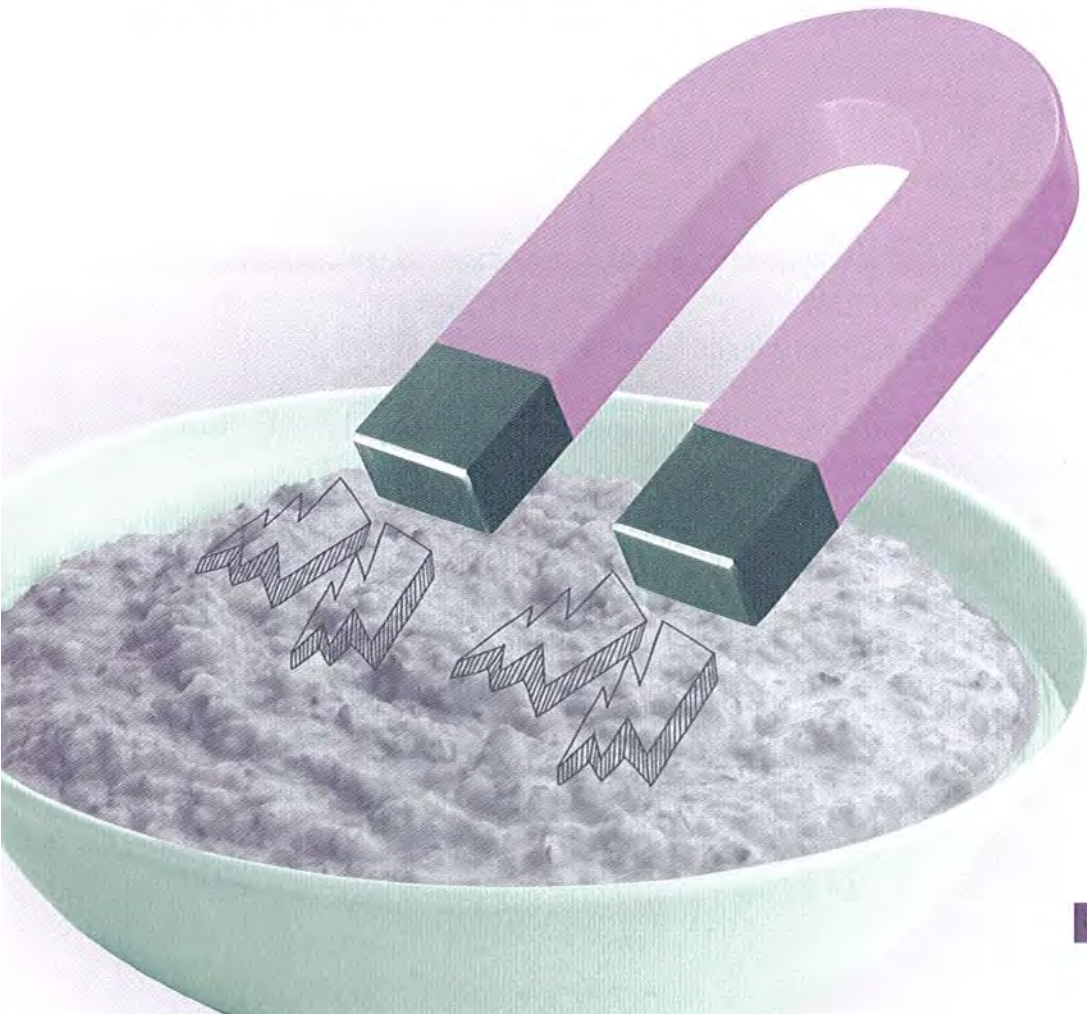
iron in the cereal. Thus, the phrase “iron-fortified” was an accurate representation of the product. Iron had been added to the cereal to make it healthier. This is a good thing. Many people today do not get enough iron from their everyday diets, and this deficiency can cause anemia, a blood disorder.

For my next science project, I intend to diversify to other foods in order to see whether advertising claims are accurate. Science seems to be the perfect domain in which to test the truth about the foods we eat. There is a lot of false advertising out there, especially about our food supply, and I want to expose it if I can.

TALK ABOUT IT

With a partner, answer the questions below. Use as many of the highlighted words in the selection as you can.

1. How did this experiment *clarify* the claim made on the cereal box?
2. Why was it important for the experiment to show *tangible* evidence of iron pieces?





Word Meanings

For each highlighted word on pages 70–71, the meaning is given below. For practice with other meanings, see pages 75–77. For synonyms and antonyms, see page 100.



- intensify**
(in-TEN-suh-fye) (v.) When you *intensify* something, you make it stronger.
- signify**
(SIG-nuh-fye) (v.) To *signify* is to be a sign of or to show something. For example, a white flag can *signify* surrender.
- element**
(E-luh-muhnt) (n.) Any substance—such as oxygen, iron, lead, or carbon—that is naturally found on Earth and has only one type of atom is an *element*.
(n.) An *element* of something is a part of the whole or an ingredient.
- phenomenon**
(fe-NO-muh-non) (n.) A fact or event that is known through the senses rather than by thought or emotion is a *phenomenon*. For example, a fact or event that can be seen and for which there is a scientific explanation is a *phenomenon*.
- precede**
(pri-SEED) (v.) An event that comes before another event is said to *precede* it. A person who arrives before another will *precede* that person.
- tangible**
(TAN-ji-buhl) (v.) When something is real or touchable, it is *tangible* or able to be understood.
- clarify**
(KLA-ruh-fye) (v.) When you explain or make something easier to understand, you *clarify* it for others.
(v.) When you make a liquid clear, you *clarify* it.
- representation**
(re-pri-zen-TAY-shuhn) (n.) A *representation* is the way something is portrayed, either visually or in words.
(n.) The act of one person standing in for many others is *representation*, such as senators providing *representation* for the people of their states.
- diversify**
(di-VUR-suh-fye) (v.) When you increase the variety of something, you *diversify* it.
- domain**
(doh-MAYN) (n.) A *domain* is an area of knowledge or study—often one that a person has an interest in.
(n.) A king's *domain* is the area over which he rules or has complete control.

Word Talk

Each lesson word has been placed in a category. With a partner, discuss and list items that belong in each category. Compare your results with those of another pair of students.

A Phenomenon That Seems Unbelievable

Activities That Precede Sports Competitions

Things That You Might Clarify

Activities Within the Domain of the Arts

Elements Found on Earth

Feelings That Can Intensify

Representations for the Word "No"

Ways to Diversify Your Activities

An Image That Signifies an Idea

Tangible Results of Hard Work

Check for Understanding

Choose the lesson word that completes each sentence. Write the word on the line provided. Some words will be used twice.

clarify

element

representation

diversify

intensify

signify

domain

phenomenon

tangible

precede



- The museum exhibit showed _____ evidence of its expertise.
- Jocelyn's eyes were fixed on the juggler's balls circling in the air, because she had never seen such a/an _____ before.
- One _____ I want to learn more about is lead.
- Flag bearers will _____ the athletes marching in the parade.
- Wearing 3-D glasses will _____ the special effects of the movie.
- My teacher tried to _____ the lesson by drawing me a picture.
- The salesman's _____ of the saw's ability to cut through wood was impressive, so my father bought one.
- A red circle with a line through it can _____ "No!" or "Forbidden."
- The addition of the foreign exchange students will _____ the languages spoken by students in our school.
- Grandpa Cruz could cook, but construction skills were out of his _____.
- Ana made sure she had included each _____ of the periodic table, including copper and gold, before she handed in her science chart.
- A sore throat will often _____ a bad cough and a cold.



Expand Word Meanings

Read the paragraph below to learn other meanings for some of the lesson words.

My teacher, Ms. Roberti, provided representation for our school at a science fair in Scotland. That country is within the domain of the queen of England, so Ms. Roberti, who is from Brooklyn, felt a bit out of her element. While she was there, Ms. Roberti learned about super magnets. "Rare earth magnets" are made from nickel or lead. Yet they produce so much magnetic power that you would have difficulty prying them off a metal table. Let's say you mixed metal shavings in a glass of water. If you used a magnet to clarify the water-shavings mixture, its super-strong pull on the metal shavings would break the glass!

Notice that the lesson's words are used in a different way here. For example, *representation* is the act of standing in for others. Look at the other highlighted words. Can you figure out the meanings of the words as they are used here? Refer to page 72 to confirm meanings.

Apply Other Meanings

Complete each sentence with a highlighted word from the paragraph above.

1. One _____ of the English paper was a bibliography.
2. The town uses filters to _____ the muddy well water and make it crystal clear.
3. Jeanne provided student _____ at the school's weekly faculty meeting.
4. Because the land was part of the government's _____, elected officials could decide who was allowed to enter the area.
5. When Alia's mother makes ghee to use in Indian dishes, she has to _____ butter by boiling out all of the water and removing milk particles.
6. An _____ of her personality that I especially liked was her humor.
7. Many of the citizens felt the mayor provided poor _____, since he rarely attended town council meetings.
8. When the ruler dies, his _____ will be divided among his sons and daughters.
9. After it rained, sediment clouded the lake, but then the water began to _____ and we could see the bottom again.
10. Although they had to pay taxes to England, the American colonists felt they received no _____ in Parliament, and that helped spark the American Revolution.

Word Associations

Use what you know about the lesson word in *italics* to answer each question. Circle the letter next to the phrase that best answers the question. Be prepared to explain your answers.

- Which type of schooling would *precede* the others?
 - college
 - kindergarten
 - eighth grade
- Who could offer *representation* in court?
 - a judge
 - a defendant
 - a lawyer
- Which is a *phenomenon*?
 - an active volcano
 - a hurtful remark
 - a soccer goal
- Which could *intensify* if ignored?
 - a tickle
 - an illness
 - a sneeze
- What might a person consider his or her *domain*?
 - leftovers
 - the kitchen table
 - cooking
- Which symbol can *signify* a warning?
 - a smiley face
 - a star
 - a skull and crossbones
- Which of the following is *tangible*?
 - a cold rainstorm
 - a radical idea
 - a frightening thought



- Which activity is an *element* of the other choices shown here?
 - opera singing
 - constant practicing
 - dramatic acting
- How could you *diversify* your interests?
 - do the same things
 - find a new hobby
 - stop some activities
- Which response would help you *clarify* your understanding?
 - an explanation
 - a criticism
 - a misunderstanding

Check Again

Use what you know about the lesson word in italics to complete each sentence. Be sure your sentences make sense.

1. You wouldn't want an argument to *intensify* because _____
2. If you wanted to *precede* your friends, you would _____
3. When you trust a *representation* of the facts, you _____
4. If you wanted to break down a play into just one *element*, you _____

5. People might consider gardening your *domain* if _____

6. To *clarify* a command that the people you are talking to do not understand, you could _____

7. One way to *diversify* your clothing is to _____

8. A few *tangible* objects that are near me now are _____
9. If you wanted to *signify* that someone should not continue walking, you _____

10. Homelessness is a *phenomenon* that _____

Challenge Yourself

Follow the directions to write sentences with the lesson words in italics. Be sure your sentences make sense both grammatically and in meaning.

Write
Your Own

1. Write a sentence with *element* in the ninth position.
2. Write a sentence exactly thirteen words in length using the word *tangible*.
3. Write a question with the word *precede* in the third position.

Word-Solving Strategies: Suffixes

The suffix **-ify**: “to make into”

Suffixes can modify the meaning of a root word. A suffix can change the root into a different part of speech. The suffix *-ify* turns adjectives or nouns into verbs.

The lesson word *diversify* is a good example. The food sources available to you may not be that *diverse*, or varied, but if you decided to *diversify* them, you would vary your choices.

Another lesson word, *signify*, comes from the Latin root *signum*, or “sign.” When you *signify* something, you express it or make a sign for it. For example, you can signify happiness with a fist pump or a smile. Each gesture makes a sign for the feeling.

Similarly, the root adjective *intense* is combined with *-ify* to make the lesson word *intensify*, which means “to make stronger.”

Example

Some words with the suffix *-ify* do not contain an obvious English root word. That’s because the suffix has been added to a Latin root word, not an English one. The Latin roots below create verbs by adding *-ify* and changing the spelling slightly in modern English.

magnificus (larger) → magnify

justus (right) → justify

petra (rock) → petrify

ratus (determined) → ratify

verus (true) → verify

qualis (of such a kind) →
qualify

fortis (strong) → fortify

Although you can add the suffix *-ify* to many base words to get the new word, you will sometimes need to change the base word’s spelling before you add the suffix. For example, for the lesson word *diversify*, you must drop the final *e* in *diverse* before you add the suffix *-ify*. This is also true when changing the adjective *intense* into the verb *intensify*.

BE CAREFUL!

Practice

Use what you’ve learned about the suffix *-ify* to create verbs from the following adjectives or nouns.

1. horror _____

2. liquid _____

3. solid _____

4. beauty _____

5. glory _____

6. object _____

7. ample _____

8. false _____

9. humid _____

10. terror _____

Practice for Tests

Fill in the bubble next to the answer that best completes the sentence or answers the question.

1. Read this sentence.

As you throw more wood on the fire, the heat will *intensify*.

Intensify means:

- A become greater
- B explode
- C lessen
- D stay the same

2. Which of these does not *signify* silence?

- A shushing
- B finger over lips
- C blinking lights off and on
- D shaking the head

3. The opposite of *element* is:

- A mineral
- B function
- C whole
- D segment

4. Which would NOT be a *phenomenon*?

- A confusion
- B an eclipse
- C a beautiful sunset
- D lightning

5. A word closely associated with *clarify* is:

- A clean
- B cloudy
- C clear
- D erase

6. Read this sentence.

Which activities will *precede* the wedding on Saturday?

Precede means:

- A greatly improve
- B complete
- C follow
- D come before

7. An area is your *domain* if:

- A you are nearby
- B you control it
- C you visited there
- D you have friends there

8. When you *diversify*, you do NOT:

- A maintain
- B substitute
- C add
- D change

9. You would most likely find citizen *representation* occurring in the:

- A Washington Monument
- B Lincoln Memorial
- C Congress
- D FBI building

10. *Tangible* evidence would:

- A be misplaced
- B be provable
- C cause confusion
- D not be witnessed

Two-Time Nobel Prize Winner Dies

<obituary>

July 4, 1934 SALLANCHES, France —

“Nothing in life is to be feared. It is only to be understood.” The world remembers the wise woman who spoke these words: Marie Curie, whom we lost today at the age of 67. The cause of death was leukemia, a cancer of the blood. It resulted from exposure to the particles of radium that Curie co-discovered and that made her world famous.



Scientist, professor, wife, mother, and patriot—Marie Curie was all of these things in a time when women were not considered the equals of men. Born Marie Sklodowska in Poland in November 1867, Curie was a brilliant student. Denied admission to college because of her gender, she emigrated to France to continue her science studies. At the Sorbonne, a university in Paris, she met and married Pierre Curie, who became her greatest advocate and collaborator. Fascinated by recent scientific findings, together they focused on a search for new radioactive elements. Their work led to ground-breaking discoveries, although they did not completely understand radium’s dangers.

In 1903, the Curies and a fellow scientist, Antoine Henri Becquerel, were awarded a Nobel Prize in Physics for their efforts. Only a few years after receiving the award, Pierre died in a traffic accident. Following a brief interval of mourning, Marie Curie returned to her research and took over Pierre’s teaching position. Although people were civil, it was not easy being the Sorbonne’s first female professor.

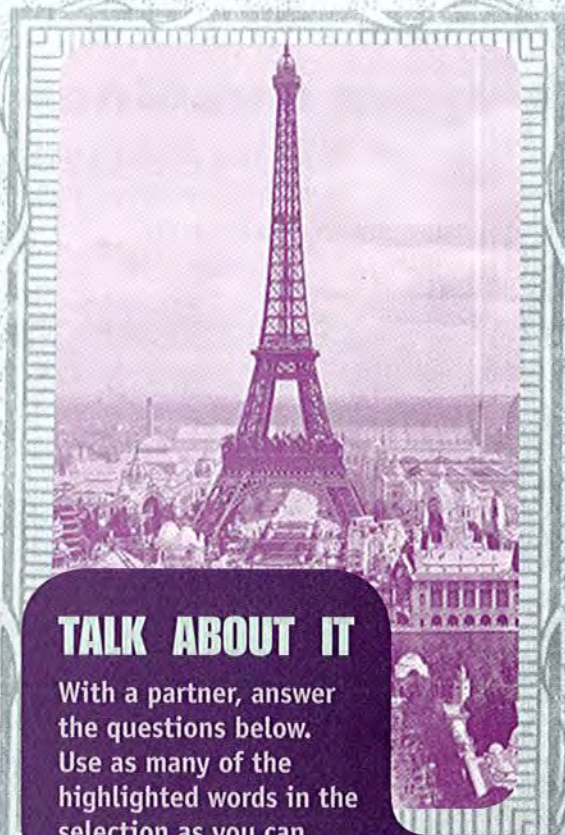
In 1911, Curie’s continuing research earned her a second Nobel Prize. During World War I, she began to work for the welfare of her adopted country. Because of her expertise in radioactivity, Curie was able to equip vans used to treat wounded French soldiers with a new innovation: portable x-ray machines. When military personnel returned to civilian life, Curie began work at a center devoted to nuclear physics.

Curie is survived by her two daughters and will be buried alongside her husband. She will be remembered as a determined scientist and winner of a succession of prestigious awards.

VOCABULARY

particles
advocate
radioactive
interval
civil

welfare
innovation
civilian
nuclear
succession



TALK ABOUT IT

With a partner, answer the questions below. Use as many of the highlighted words in the selection as you can.

Left: Curie in her lab
Above left and right: Scenes from Paris, Curie's home
Below: Pierre and Marie Curie
Inset: The Nobel Peace Prize

1. Why was the x-ray machine such an important *innovation*?

2. Why do you think people were *civil* when Curie became the Sorbonne's first female professor?



Word Meanings

For each highlighted word on pages 80–81, the meaning is given below. For practice with other meanings, see pages 85–87. For synonyms and antonyms, see page 100.

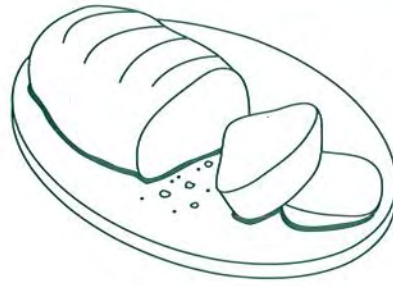
1. **particles**
(PAR-ti-kuhlz)
(n.) *Particles* are tiny parts or pieces, such as specks or nearly invisible fragments.
2. **advocate**
n. (AD-vuh-kit)
v. (AD-voh-kayt)
(n.) A person who serves as an *advocate* speaks out or pleads for the cause of another by defending or supporting that other person.
(v.) When you defend or support someone or some idea, you *advocate* on his behalf or act in favor of the idea.
3. **radioactive**
(ray-dee-oh-AK-tiv)
(adj.) Something that is *radioactive* gives off atomic energy when its nucleus is broken down.
4. **interval**
(IN-tur-vuhl)
(n.) The amount of time between two events is an *interval*, such as halftime in a basketball game.
(n.) An *interval* is the measured distance between two objects, such as the space between ladder rungs.
5. **civil**
(SI-vuhl)
(adj.) Acting in a *civil* fashion is being polite, well-mannered, or courteous.
(adj.) Something described as *civil* relates to citizens or the general population.
6. **welfare**
(WEL-fair)
(n.) *Welfare* is a state of happiness, good fortune, well-being, or health.
(n.) Money or aid given to help people meet basic needs is *welfare*.
7. **innovation**
(i-nuh-VAY-shuhn)
(n.) A new product, idea, or way to do something is an *innovation*.
8. **civilian**
(si-VIL-yuhn)
(adj.) *Civilian* life involves the daily activities of people who do not serve in the military or work as police officers or firefighters.
9. **nuclear**
(NOO-klee-uhr)
(adj.) Something described as *nuclear* relates to the nucleus of an atom or to weapons and power sources that use energy from atoms.
10. **succession**
(suhk-SE-shuhn)
(n.) *Succession* is a number of things that follow each other in order, such as a *succession* of airplanes taking off at the airport.
(n.) The order in which people obtain property or a title such as king is *succession*.



Word Talk

Each lesson word is listed here. With a partner, take turns drawing a picture to illustrate the meaning of six of the words. As one partner draws, the other partner identifies the vocabulary word.

advocate (n.)
civil
civilian
innovation
interval
nuclear
particles
radioactive
succession
welfare



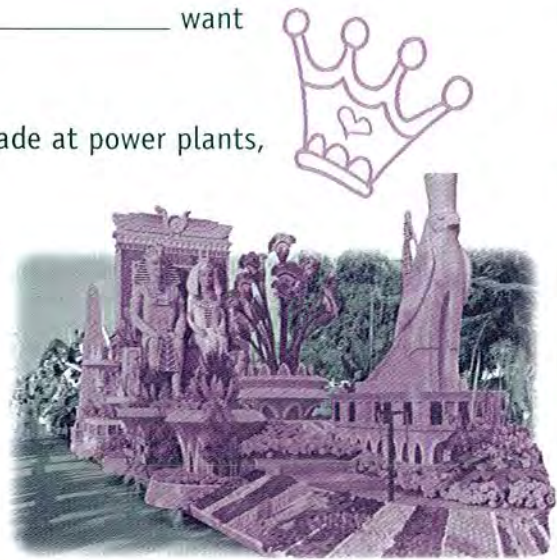
particles

Check for Understanding

Choose the lesson word that completes each sentence. Write the word on the line provided. Some words will be used twice.

advocate	innovation	radioactive
civil	interval	succession
civilian	nuclear	welfare
	particles	

- Parents who worry about their children's _____ want them to be happy.
- Although some _____ energy is made at power plants, the sun produces it naturally.
- Even tiny _____ of dirt can hurt if they get in your eyes.
- His invention was not a/an _____ because it just used the same old technology.
- The order of the floats passed in the same _____ as last year's parade.
- In _____ life, a soldier may find it odd not to wear his uniform.
- Our family's lawyer is a/an _____ who protects our rights in court.
- The _____ waste had to be cleaned up and disposed of correctly.
- The penguins at the zoo lined up and dove into the water in _____.
- Because the coach was _____ when he disputed the umpire's call, the umpire listened to what he had to say.
- There was a long _____ between the first and second swim meets.
- The air filter caught many different kinds of _____: specks of dust, insect parts, powdered rock, and pollen.



Expand Word Meanings

Read the paragraph below to learn other meanings for some of the lesson words.

With radiation, it doesn't matter who you are. Radioactive materials present the same danger of cancer to all, whether one receives welfare or is next in the line of succession to a royal throne. There is no cure for the disease, but there are treatments. Doctors may advocate for chemotherapy because of its success in destroying cancerous cells. Some people have trouble affording chemotherapy; each treatment is expensive and must be given at a regular interval. Many citizens consider it a civil duty to help patients in their community. They host fundraisers so those with the illness can receive the treatments.

Notice that the lesson's words are used in a different way here. For example, look at *welfare*. Here it means "aid given to people to meet basic needs." Look at the other highlighted words. Can you figure out the meanings of the words as they are used here? Refer to page 82 to confirm meanings.

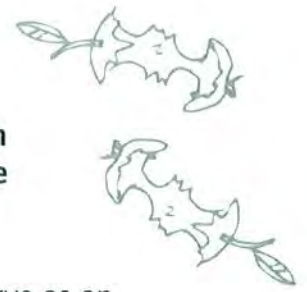
Apply Other Meanings

Complete each sentence with a highlighted word from the paragraph above.

1. The mayor and the town council have argued over _____ priorities and the needs of the people.
2. _____ to the presidency of the United States begins with the vice-president.
3. There should be a/an _____ of eighteen inches when you plant the seeds.
4. Most countries have a system that provides financial assistance and other forms of _____ to citizens who may not be able to survive otherwise.
5. The third graders asked the eighth graders to _____ on their behalf for an earlier recess period.
6. _____ responsibilities demand that the voters learn about each candidate.
7. You need to vary the _____ between each table when you set up for the wedding.
8. The line of _____ to lead the country included the queen's oldest son and her grandson.
9. When Joan got a job, she no longer needed _____ or other government aid.
10. Someone you hire to _____ for your rights must understand what you believe so he or she can accurately represent your interests.

Word Associations

Use what you know about the lesson word in italics to answer each question. Circle the letter next to the phrase that best answers the question. Be prepared to explain your answers.



1. Apple is to fruit as *nuclear* is to:
 - a. war
 - b. electric
 - c. power
2. What is the *civil* thing to do when you realize you are wrong in an argument?
 - a. continue to argue
 - b. ignore the person's opinion
 - c. apologize
3. Which word could describe *particles*?
 - a. bits
 - b. complete
 - c. segments
4. Which time unit is an *interval*?
 - a. overtime
 - b. halftime
 - c. warm-up
5. What would have a significant effect on your *welfare*?
 - a. a delicious meal
 - b. a friendship
 - c. a disease
6. What might best serve as an *advocate* for children?
 - a. a store
 - b. a playground
 - c. a charity
7. Which of these could be part of a *civilian* uniform?
 - a. a suit and tie
 - b. a fireproof coat
 - c. a set of medals
8. Which of these inventions would be an *innovation* today?
 - a. portable phone
 - b. nonpolluting car
 - c. sewing machine
9. Which word is associated with *radioactive*?
 - a. musician
 - b. atoms
 - c. outside
10. Which event requires participants to move in *succession*?
 - a. a parade
 - b. a hockey game
 - c. an election



Check Again

Use what you know about the lesson word in italics to complete each sentence. Be sure your sentences make sense.

1. People protect themselves from *radioactive* materials because _____

2. If you were an *advocate* for a new park, you might _____
3. *Particles* of food put into an aquarium will _____
4. If you are looking after the *welfare* of your pets, you _____
5. When an *innovation* becomes popular, the old way of doing things _____

6. If you behave in a *civil* way with people at a party, you _____

7. *Civilian* life is very different from military life because _____

8. People have to handle *nuclear* materials carefully or _____
9. A *succession* of snowstorms will create _____
10. An *interval* of calm air during a hurricane might mean that _____

Challenge Yourself

Follow the directions to write sentences with the lesson words in italics. Be sure your sentences make sense both grammatically and in meaning.

Write
Your Own

1. Write a sentence with the word *advocate* in the second position.
2. Write a sentence exactly ten words in length using the word *particles*.
3. Write a question with the word *innovation* in the fifth position.

Word-Solving Strategies: Context Clues

Antonyms

Authors often provide contrast by using antonyms to help define words they've used. Reread this sentence from "Two-Time Nobel Prize Winner Dies."

When military personnel returned to civilian life, Curie began work at a center devoted to nuclear physics.

By using the word *military*, which is the opposite of **civilian**, the author helps the reader to understand what **civilian** means. **Civilian** life is life outside of the military.

Not every antonym can provide a clue to a word's meaning. Read this sentence:

The castle's ancient portcullis gave way to a modern steel gate.

The antonyms *ancient* and *modern* describe different versions of a gate. But they don't define a *portcullis*, or a castle's gate.

BE CAREFUL!

Practice

A. Write a highlighted word and its antonym in the first two boxes. Use context clues to write the meaning for the word in the third box.

Rachel Carson wasn't just a scientist. Her true gift was writing about science. She **supplemented** her income by writing articles, because college tuition had depleted her savings. She wrote about both the **preservation** and the destruction of nature. Her **exemplary** prose charmed readers who were used to ordinary science writing that tended to be dull. Her masterpiece, *Silent Spring*, proved that **imperiled** bird species could increase once again if humans controlled their use of pesticides

WORD

ANTONYM

WORD MEANING

B. Write a sentence for each of the four highlighted words from the paragraph above. Create antonym context clues. Ask a peer if you need help.

1. _____
2. _____
3. _____
4. _____

Practice for Tests

Fill in the bubble next to the answer that best completes the sentence or answers the question.

1. Read this sentence.

The student council president acted as an *advocate* for student rights.

In this sentence, *advocate* means:

- A supporter
- B debater
- C opponent
- D challenger

2. An invention is an *innovation* when it:

- A continues
- B repairs
- C breaks
- D modernizes

3. If something is NOT *civilian*, it can be:

- A professional
- B official
- C military
- D populous

4. In which group can all the items or events normally be seen in *succession*?

- A note taking, studying, tests
- B cameras, shoes, earthquakes
- C cars, mountains, hopes
- D stoves, baseballs, practice

5. A word closely associated with *civil* is:

- A sergeant
- B company
- C citizen
- D individual

6. Read this sentence.

The police ensure the *welfare* of the town's citizens at night.

Welfare means:

- A sleep
- B well-fed
- C wealth
- D well-being

7. Matter is described as *nuclear* if it is:

- A exterior
- B atomic
- C visible
- D miniature

8. Which of these do *radioactive* materials need to give off energy?

- A a reaction
- B chemistry
- C science
- D living beings

9. You might detect an *interval* in a:

- A beam
- B flow
- C series
- D solid

10. The size of *particles* most closely compares to:

- A sheets of paper
- B points of pins
- C width of dimes
- D shape of ice cubes

The Tennessee Coal Ash Case

<editorial>

January 2009: When the tragic coal ash spill occurred last month in eastern Tennessee, the government promised immediate action. They assured us they'd create new national standards for disposing of coal ash. It's been a month and nothing has happened in response to this enormous environmental disaster.

When coal is burned, one thing left over is an extremely fine powder called coal ash. Because coal ash is hard to capture, it's often mixed with water and stored in a collection pond.

The dirt dam surrounding such a pond broke last month. When it did, it released a flood of 500 million gallons of liquid ash. This river wasn't harmless. It contained mercury, arsenic, and other sinister toxins – all known to cause birth defects. Not only did the spill destroy nearby properties, but it is feared it may also have polluted the water supply.

It is not the first time that a dirt dam has failed. It is clear that the government must immediately prohibit this kind of coal ash



Land damaged by the coal ash spill

VOCABULARY

sinister	status
properties	differentiate
prohibit	tolerate
professional	endeavor
protocols	remedy

storage. Professional environmental engineers agree that different protocols and methods of storage must be used in order to prevent further disasters. We also believe that the government needs to change the status of coal ash. While it is currently labeled a “special waste,” it should be labeled “hazardous.” It is wrong to differentiate coal ash from other hazardous materials.



A map of Tennessee. The flag marks the location of the coal ash spill.

At the same time, companies and agencies that burn coal have responsibilities. Using safer, more effective ways to deal with coal ash may prove initially more costly. However, in the long run, they would save the millions or billions of dollars it costs to clean up after a spill.

Tennessee has just experienced the largest coal ash spill in our history. As citizens, we cannot tolerate this situation any longer. We must immediately endeavor to remedy it. How many more spills will it take before our government does the right thing and puts environmental safety first?

TALK ABOUT IT

With a partner, answer the questions below. Use as many of the highlighted words in the selection as you can.

1. Should the government step in to help remedy the situation? Why or why not?
2. Why is this situation so difficult for people to tolerate?

Word Meanings

For each highlighted word on pages 90–91, the meaning is given below. For practice with other meanings, see pages 95–97. For synonyms and antonyms, see page 100.



1. **sinister**
(SI-ni-stur) (adj.) When something is *sinister*, it is evil or causes a person to be fearful.
2. **properties**
(PRO-pur-teez) (n.) Land and houses or other buildings are called *properties*.
(n.) Qualities or traits that are specific to a person, animal, or object are its *properties* or characteristics.
3. **prohibit**
(proh-HI-bit) (v.) When you *prohibit* an activity, you use your authority to forbid anyone from doing it.
4. **professional**
(pruh-FE-shuh-nuhl) (adj.) Something that is *professional* is related to a job that requires a specialized education or knowledge.
(n.) Someone who has worked in a career field that requires special knowledge and training is a *professional*.
5. **protocols**
(PROH-tuh-kawlz) (n.) The rules that establish the correct way to behave or act are *protocols*.
6. **status**
(STA-tuhss) (n.) *Status* is the legal state or condition of something or someone. For example, marital *status* indicates whether or not a person is married.
7. **differentiate**
(di-fur-REN-shee-ayt) (v.) When you *differentiate* between things, you detect a difference between them.
8. **tolerate**
(TO-luh-rayt) (v.) When you put up with or allow something to continue, you *tolerate* it.
9. **endeavor**
(en-DE-vur) (v.) When you *endeavor* to do something, you work with the purpose of accomplishing a task.
(n.) An *endeavor* is a serious effort or a purposeful, determined attempt.
10. **remedy**
(RE-muh-dee) (v.) When you correct, cure, or make something better, you *remedy* it.
(n.) Any medicine, treatment, or solution that relieves a problem or cures an illness is a *remedy*.

Word Talk

Each lesson word has been placed in a category. With a partner, discuss and list items that belong in each category. Compare your results with those of another pair of students.

Things That Might Seem *Sinister* in the Dark

A *Status* a Person Might Hold

Activities Students Might *Endeavor* to Do

Things That Help You *Differentiate* Between Identical Twins

Ways to *Remedy* a Cold

Jobs That Require *Professional* Training

Bad Habits That You *Tolerate*

Dog Behaviors That You Would *Prohibit*

Types of *Properties*

Protocols Enforced at Home

Check for Understanding

Choose the lesson word that completes each sentence. Write the word on the line provided. Some words will be used twice.

differentiate	prohibit	sinister
endeavor	properties	status
professional	protocols	tolerate
	remedy	

1. The council member with the most votes will earn the _____ of mayor.
2. A few weeks of rest will _____ a sprained ankle.
3. Wearing dark clothing and an angry expression, the man looked _____.
4. Leaf color helps people _____ between types of trees in the fall.
5. A sign beside the pool lists the activities that the rules _____, such as running, rough play, or eating on the deck.
6. In an attempt to break the world record, my uncle will _____ to run up the stairs of the world's tallest building.
7. Carmen's brother has vacation _____ in different parts of the U.S.
8. One way Desiree followed the _____ of the formal dinner was by using her salad fork and soup spoon for the appropriate courses.
9. In the doctor's _____ opinion, the patient will be cured in less than a week if he takes the medicine as prescribed.
10. Our cat cannot _____ being teased and will run away to avoid it.
11. After graduation, my cousin will change her _____ from student to employee.
12. The parks in our town _____ dogs but allow people to ride bikes.



Expand Word Meanings

Read the paragraph below to learn other meanings for some of the lesson words.

Zinc has healing properties, but it can also be dangerous. In fact, if you are a professional who works with it, you must avoid direct contact. Recently, senior citizens began showing symptoms of zinc poisoning. Dentists noticed that the zinc found in denture cream harmed some patients. In 2008, more than 35 million people wore dentures. Scientists began an endeavor to determine how a cream so many older people use could harm them. It turns out that if false teeth don't fit well, they fall out. So people use far too much cream as a remedy to keep their teeth in, and as a result, they absorb too much zinc.

Notice that the lesson's words are used in a different way here. For example, in this paragraph, *endeavor* and *remedy* are nouns that are similar in meaning to their verb forms. Look at the other highlighted words. Can you figure out the meanings of the words as they are used here? Refer to page 92 to confirm meanings.

Apply Other Meanings

Complete each sentence with a highlighted word from the paragraph above.

1. Sam asked friends to sponsor her _____ to bike across the country.
2. Jeanne possesses all the _____ of a leader—intelligence, personality, dedication, and charm.
3. When the first _____ didn't heal my infection, the doctor prescribed a stronger medicine.
4. The plastic window's special _____ helped it resist breaking when the ball hit.
5. Don't try to repair your cell phone yourself; you need a/an _____ who has had proper training.
6. Eating more food isn't a/an _____ for your stomachache; it will make you sicker.
7. A/An _____ gets paid to play a sport that amateur athletes play for enjoyment.
8. In ancient times, doctors used leeches, small blood-sucking creatures, as a/an _____ to aid blood circulation.
9. Juan succeeded in his _____ to read every *Harry Potter* book a second time.
10. My _____ for feeling sad is to ride my bike to the pet shop with my friend.

Word Associations

Use what you know about the lesson word in italics to answer each question. Circle the letter next to the phrase that best answers the question. Be prepared to explain your answers.



- Which word describes someone's *status*?
 - power
 - position
 - beginning
- Which person could be considered a *professional*?
 - college student
 - community volunteer
 - doctor in a hospital
- Which activity would be a *remedy* for boredom?
 - bungee jumping
 - doing nothing
 - taking medicine
- Which noise from a baby could you best *tolerate*?
 - crying
 - giggling
 - screaming
- Which task would most likely be considered an *endeavor*?
 - visiting with friends
 - watching TV
 - learning to swim
- Which two items are easiest to *differentiate*?
 - an orange and a tangerine
 - two white poodles
 - a polar bear and a panda bear
- Which words describe sand's *properties*?
 - soft and tiny
 - sunshine and castles
 - ocean and lake
- Which animal seems most *sinister*?
 - a noisy squirrel
 - a growling dog
 - a leaping frog
- Which activity might a parent *prohibit* if a child misbehaved?
 - doing homework
 - playing games
 - being punished
- Which of the following is one of the usual *protocols* at a formal affair?
 - using table manners
 - arriving late
 - wearing expensive clothing



Check Again

Use what you know about the lesson word in italics to complete each sentence. Be sure your sentences make sense.

1. If you wanted to *prohibit* your cat from going outside, you could _____

2. To become a *professional*, a person must _____
3. If you needed a *remedy* for a problem, you might _____

4. Most parents and other adults will not *tolerate* _____
5. One way to *differentiate* between brands of food is to _____
6. World leaders need *protocols* when they deal with other countries because _____

7. After completing his driver's education class, Kyle officially changed his *status* by _____

8. The *properties* of a piece of sandpaper are _____
9. Movies often indicate that something *sinister* is about to happen by _____

10. You might take part in a bold *endeavor* because _____

Challenge Yourself

Follow the directions to write sentences with the lesson words in italics. Be sure your sentences make sense both grammatically and in meaning.

Write
Your Own

1. Write a sentence with the word *professional* in the eighth position.
2. Write a sentence exactly eleven words in length using the word *remedy*.
3. Write a question with the word *sinister* in the ninth position.

Word-Solving Strategies: Prefixes

The prefix **pro-**: “forward,” “before”

You’ve already learned how to use a word’s root as well as its suffix and prefix to determine its meaning. The lesson words *professional* and *prohibit* have the prefix *pro-*, which means “forward” or “before.”

The lesson word *prohibit* comes from the Latin word *prohibere*, meaning “to keep off.” The prefix *pro-*, which means “forward,” was added to the Latin word *habere*, meaning “to hold.” To *prohibit* is to keep someone from going forward with an action or activity.

The lesson word *professional* comes from the word *profess*, which means “confess or claim.” It is a combination of *pro-*, meaning “before,” and the Latin word *fateri*, meaning “acknowledge.” The meaning of *professional* comes from the idea that one publicly states, or acknowledges before others, a career.

Examples

Look at these examples of words that begin with the prefix *pro-*. Think about how the Latin prefix *pro-* affects the meaning of the English words. If you are not sure what a word means, look up its definition in the dictionary.

pro- + *gradi* (to go) →
progress

pro- + *jacere* (to throw) →
project

pro- + *legein* (to speak) →
prologue

pro- + *movere* (to move) →
promote

Not all words that begin with *pro-* come from the prefix *pro-*. The lesson word *properties* comes from the Latin word *proprietas*, which means “own.” The lesson word *protocols* comes from the Greek word *protokollon*. The prefix *protos*, which means “first,” was added to the Greek word *kola*, meaning “glue.”

BE CAREFUL!

Practice

Use what you’ve learned about the prefix *pro-* to write sentences using words with the prefix *pro-*.

1. protest _____

2. provide _____

3. propose _____

4. pronoun _____

5. proclamation _____

6. promenade _____

Practice for Tests

Fill in the bubble next to the answer that best completes the sentence or answers the question.

1. Read this sentence.

She will *endeavor* to win championships in three sports.

Endeavor means:

- A try
- B fail
- C succeed
- D go beyond

2. One way to *differentiate* items would be to:

- A put everything together
- B choose them randomly
- C store them neatly
- D sort them based on what's unlike

3. The opposite of *prohibit* is:

- A remove
- B confuse
- C allow
- D preserve

4. Which group lists *professional* people?

- A nurse, lawyer, teacher
- B student, policeman, helper
- C psychiatrist, builder, intern
- D politician, apprentice, farmer

5. A word closely associated with *status* is:

- A opinion
- B country
- C condition
- D question

6. Read this sentence.

The wealthy movie star has *properties* in six different countries.

Properties means:

- A fans
- B vacations
- C money
- D homes

7. A person may be *sinister* if he or she:

- A gives you a gift
- B frightens you
- C greets you
- D introduces you to a sibling

8. When you *remedy* a problem, it does NOT:

- A continue
- B cure
- C improve
- D retreat

9. One of the *protocols* at an orchestra concert is:

- A booing when you don't like it
- B playing a musical instrument
- C clapping at the end of each song
- D eating in your seat while listening

10. A person will *tolerate* something when he:

- A walks over to it
- B puts up with it
- C continues without it
- D reaches for it

Synonyms and Antonyms

In the following Word Bank, you will find synonyms and antonyms for some of the words in Lessons 7–9. (Remember: Some words have both synonyms *and* antonyms.) Study these words; then complete the exercises below.

weaken interests valuable opponent scary rude
compete strengthen ban follow amateur explain

A. For each sentence, fill in the blank with a **SYNONYM** for the word in boldface.

1. Government policies **prohibit** smoking and _____ the use of any tobacco product in public buildings.
2. If you want to **intensify** the flavor of hot cocoa, add a bit of cinnamon to _____ the taste.
3. When my little brother dreams about _____ monsters, Mom comforts him by explaining that the **sinister** creatures do not exist.
4. Our teacher will _____ the assignment to the class and **clarify** anything that we do not understand.
5. The candidate supports the _____ of only one group of people even though he talks about the **welfare** of all citizens.

B. For each sentence, fill in the blank with an **ANTONYM** of the word in boldface.

6. Our new neighbor is _____. Still, I ignore his bad manners and treat him in a **civil** way.
7. A family breakfast will **precede** the graduation ceremony, and an afternoon party will _____.
8. As a/an _____ golfer, I know I won't be able to repeat the amazing shots that **professional** golfers make.
9. My grandmother is an **advocate** of the candidate, and she will debate anyone who is a/an _____ of this man.
10. We hoped the hurricane would not **intensify** before it reached land, and we were relieved when we found out that it would _____.

Word Study: Proverbs

A **proverb** is a popular saying that expresses a widely held idea. These two proverbs express opinions about people who are not careful with their money: “Money burns a hole in your pocket” and “A fool and his money are soon parted.”

Some of the words in Lessons 7–9 have meanings that can be expressed as proverbs. There’s a proverb, for example, that defines what a good **remedy** (Lesson 9) is: “A stitch in time saves nine.” This proverb expresses the idea that it’s better to remedy a problem (like a hole in a sock) early before it gets worse.

Practice

Read each sentence. Use context clues to figure out the meaning of each proverb in bold print. Then, write the letter of the explanation for the proverb in the sentence.

- | | |
|--|---|
| <p>_____ 1. They say you can’t teach an old dog new tricks, but my father started playing the piano in his forties.</p> | <p>a. It’s important to share rather than just take what you want.</p> |
| <p>_____ 2. Convinced that the early bird catches the worm, Trai got to the audition an hour early.</p> | <p>b. A job is done easily if many people share the responsibility.</p> |
| <p>_____ 3. Bibi asked Gina to help her solve the puzzle, figuring two heads are better than one.</p> | <p>c. A second person might help figure out the answer to a question.</p> |
| <p>_____ 4. Because many hands make light work, our whole family helps clean the house every Saturday morning.</p> | <p>d. Something different seems better than what you have.</p> |
| <p>_____ 5. Instead of being happy with what he had, Silas always thought the grass was greener on the other side of the fence.</p> | <p>e. It’s difficult for adults to learn new things.</p> |
| <p>_____ 6. It seems that every cloud has a silver lining, because after missing the bus, Shana found money on the sidewalk.</p> | <p>f. Even in bad things, there is something good.</p> |
| | <p>g. Arriving first gives you an advantage.</p> |

Practice

Work with a partner to figure out the meaning of each proverb. (Use an online or print dictionary.) Then, work together to write a sentence for each proverb.

- | | |
|-------------------------------------|--|
| <p>1. Curiosity killed the cat.</p> | <p>5. A watched pot never boils.</p> |
| <p>2. Waste not, want not.</p> | <p>6. A rising tide lifts all boats.</p> |
| <p>3. Let sleeping dogs lie.</p> | <p>7. Good fences make good neighbors.</p> |
| <p>4. Still waters run deep.</p> | <p>8. Every dog has his day.</p> |

Vocabulary for Comprehension

Read the following passage, in which some of the words you have studied in Lessons 7–9 appear in boldface type. Then answer questions 1–6.

An Express Elevator to Space

The 1969 moon landing was long thought to be science's greatest achievement. That effort used rockets whose costs **prohibit** them from being used for frequent space travel.

- 5 Scientists have tried to **advocate** for a space elevator that would lift payloads into space on a cable. Payloads are the extra contents that a vehicle carries. Using **nuclear** power for this **endeavor** is both dangerous and impractical.
- 10 The **radioactive** waste it generates is one of the payloads we need to dispose of!

Recent competitions have attempted to **remedy** this problem. An important **element** of the space elevator is the cable. It must possess the

- 15 necessary **properties** of great strength and little weight.

The winners of a 2009 competition built a true elevator. It was covered in cells that were powered by light. Laser beams aimed at it

20 provided the power, but scientists feel they will have to **intensify** these lasers to provide adequate thrust to get it into space. The winner was a two-foot by two-foot craft that could not lift a real payload, and it traveled only

25 about eight miles an hour. It will take more **innovation** to send machinery and people into space cheaply, but this space race is on.

1. In sentence 2, **prohibit** means

A forbid
 B require
 C increase
 D remind

2. When you **advocate** (line 5), you

A dedicate
 B oppose
 C plan
 D encourage

3. An **element** (line 13) is a

A kind
 B way
 C part
 D technology

4. Another word for **properties** (line 15) is

A characteristics
 B expenses
 C responses
 D looks

5. Something that would NOT **intensify** (line 21) would be

A just getting started
 B underpowered
 C at its limit
 D completely rebuilt

6. Science always needs **innovation** (line 26) to

A show what's wrong
 B save money
 C use old technology
 D solve problems

