

WHAT'S AHEAD?

In this section, you will read a newspaper article and learn how to

- infer causes and effects
- analyze cause-and-effect patterns

Reading a Cause-and-Effect Article

“Fire! Fire!” someone yells. What do you do? You move fast because you know that fires can be dangerous and destructive. You have seen, in newspapers and on television, dramatic images of raging fires destroying buildings or forests. Keep in mind, however, that although news stories typically focus on the negative effects of fire, fires can also have positive effects. The article on the next page, “Yellowstone Makes a Triumphant Return Ten Years After Fires,” describes the positive effects that the massive forest fires of 1988 had on Yellowstone National Park.

Preparing to Read

READING SKILL

Inferring Causes and Effects Often when you read, you recognize a cause-and-effect relationship because the writer directly states that relationship. At other times, the relationships are less obvious, and you have to make an **inference**—an educated guess based on your own knowledge and experience—about the causes or the effects. The article on the next page deals with several cause-and-effect relationships. The writer directly states some; others are not as obvious.

READING FOCUS

Cause-and-Effect Structure Writers organize their explanations of cause-and-effect relationships by focusing on **causes**, on **effects**, or on **causal chains**. (Causal chains begin with the first cause and follow with a series of intermediate actions or events to the final effect.) For example, an essay focusing on causes identifies and explains several causes of one effect. An essay focusing on effects identifies and explains several effects resulting from one cause. An essay focusing on a causal chain identifies and explains multiple causes and effects. As you read the following article, see if you can tell whether the author focuses on causes, on effects, or on a causal chain.

Reading Selection

The following article from the *Austin American-Statesman* describes the effects that the immense forest fires of 1988 had on the wild lands of Yellowstone National Park. As you read, jot down answers to the numbered active-reading questions.

Yellowstone Makes a Triumphant Return Ten Years After Fires

BY BRUCE BABBITT

What a difference a decade makes. Ten years ago this month, Yellowstone National Park was a sea of flames. Some of the largest wildfires in U.S. history swept restlessly across the park's magnificent terrain, incinerating forests, threatening historic buildings. The news media and politicians fanned the flames even higher. Yellowstone, they said, was devastated.

Night after night, horrific images of ash and flame flashed across America's TV screens. One evening, after showing an enormous expanse of blackened forest, network news anchor Tom Brokaw solemnly concluded: "This is what's left of Yellowstone tonight."

But guess what? Fire didn't destroy Yellowstone. Ten years

later, we realize fire had the opposite effect. Fire rejuvenated Yellowstone. Elk and other wildlife are healthy. Tourism is thriving. Biodiversity is booming. New forests are rising from the ashes of old ones. The recovery is so dramatic it deserves a closer look.

First, a bit of background: The 1988 fires were gigantic. They swept over roughly 793,000 of Yellowstone's 2.2 million acres—one third of the park. Some were lightning-caused; others were of human origin. The \$120 million firefighting effort amassed against them has been called the largest in U.S. history. The heroic work saved many key structures. But in the wild lands, it made almost no difference. What put Yellowstone's

fires out was not retardant-dropping planes or armies of firefighters on the ground. It was a quarter inch of autumn rain.

In July and August, as fires raged across the park, business owners fumed. Our future is ruined, they said. Tourism is dead. But today, tourism is very much alive. Yellowstone has set numerous visitation records since 1988. Fire has not repelled tourists; it has attracted them—just as it attracts many species of wildlife. Ten years later, the number one question asked of Yellowstone naturalists remains "What are the effects of the fires?"

The answer is simple: The fires were therapeutic. Since 1988, some seventy scientific research projects have looked

1. As the fires raged, what long-term consequences did people expect?

2. What caused the fires?

at various aspects of the Yellowstone fires. Not one has concluded the fires were harmful. That sounds too good to be true. But it is. The science is there to prove it.

Come to Yellowstone this summer and see for yourself. Pull off the road near Ice Lake, east of the Norris Geyser Basin. Here the fire burned especially savagely. Hundreds of thousands, perhaps millions, of mature lodgepole pine trees were destroyed. But today, the forest floor is a sea of green—knee-high lodgepoles planted, literally, by the fires of 1988.

Yellowstone's lodgepole forest is a place of mystery. In order to live, it must first die. It must burn. The fire that swept through here worked an ancient magic: It scorched lodgepole cones, melted their sticky resin, and freed the seeds locked inside. Within minutes, a new forest was planted.

By suppressing wildfire, as Smokey Bear has taught us to do, we interrupt nature's cycles. We rob our western forests of something they need

desperately. We steal their season of rebirth. Without fire, pine forests grow senile, prone to disease, and unnaturally thick. There are lessons in these lodgepoles. Too much protection is no virtue. We can harm what we try to save. I'm not suggesting that we worship fire—that we let it run wild outside of natural parks and wilderness areas. But we can respect its wisdom. We can treat it, when possible, as an ally, not an enemy, and use it more frequently under controlled conditions to protect communities and make forests healthier.

Look closely around Ice Lake and you will almost surely see something else: wildlife. Bison, elk, mule deer, white-tailed deer, bighorn sheep, and mountain goats have all prospered since 1988. Just as fire rejuvenated lodgepoles, so, too, did it revitalize plants that grazing animals eat. Walt Disney got it wrong: Bambi and his forest friends have nothing to fear—and much to gain—from fire.

If you're lucky, you may also see Yellowstone's king of beasts: the grizzly bear. To a grizzly, wildfire is a meal ticket. Fires kill trees, which fall to the ground and fill up with insects: grizzly sushi. Others enjoy the feast, too. Before 1988, three-toed woodpeckers were almost nonexistent in Yellowstone. After 1988, one ornithologist spotted thirty in one day. But dead lodgepoles are more than lunch counters; they are housing opportunities, home sites for mountain bluebirds, tree swallows, and other "cavity-nesting" birds and mammals.

Ten years ago, the news media said fire "blackened" Yellowstone. Today, we know the reverse is true. Fire has painted the park brighter, added color and texture to its ecosystem, and increased the diversity and abundance of its species. As Yellowstone scientist John Varley put it recently, "The biodiversity story over the past ten years has been fascinating. Biodiversity has gone through a revolution at Yellowstone."

3. What is one effect of the Yellowstone fires?

4. What conclusion does the writer draw about forest fires?

5. What animals benefit from fallen trees?

First Thoughts on Your Reading

Work with a partner to answer the following questions about “Yellowstone Makes a Triumphant Return.” Jot down your answers on a sheet of paper.

1. The first two paragraphs of the article describe the fire and devastation of 1988. What reaction do you think the writer is trying to provoke in his readers?
2. Who do you think was the original intended audience for this article? Was it the general public? park service workers? Yellowstone business owners? What makes you think your choice is right?
3. What effect do you think the lessons taught by the 1988 Yellowstone fires will have on future conservation efforts?

Inferring Causes and Effects

Making a Connection When you read that one action or event is the result of another action or event, you are reading about a cause-and-effect relationship. A **cause** makes something happen; an **effect** is what happens as a result of that cause. The link between cause and effect can sometimes be very obvious; at other times you may be required to make an educated guess about the connection.

When writers want to make cause-and-effect relationships very obvious for the reader, they do so with clue words that signal the cause-and-effect relationship. The Yellowstone article, for example, notes that some of the fires were “lightning-*caused*.” The relationship between lightning and the fires is very clearly signaled by the word *caused*. A few more words and phrases that can signal cause-and-effect relationships are

| | | | | |
|-------------|--------------|---------------|---------------|-----------|
| accordingly | because | effect | in order that | since |
| affect | cause | for | reason | therefore |
| as a result | consequently | if . . . then | results in | why |

At times a writer only hints at a cause-and-effect relationship. In such cases, you will have to combine details in the text with your own knowledge and experience to make an educated guess about a cause-and-effect relationship. When you make an educated guess about probable causes or probable effects, you are **inferring** the presence of a cause-and-effect relationship that the writer has **implied**. For example, in “Yellowstone Makes a

READING SKILL



TIP

Be careful.

Sometimes clue words and phrases have uses unrelated to cause-and-effect relationships, as in the sentences, “His **cause** is just” or “She has not visited **since** she was a baby.”

Triumphant Return Ten Years After Fires,” the writer states that though some fires were caused by lightning, “others were of human origin.” The writer assumes that you are familiar enough with forest fires to infer what the “human” causes might have been: campers leaving a campfire unattended or out of control, or children playing with matches, for example.

THINKING IT THROUGH

Inferring Causes and Effects

You can use the following steps to infer, or make an educated guess about, implied cause-and-effect relationships. The process is modeled for you using a sentence from the article about the Yellowstone fires.

Example:

“Without fire, pine forests grow senile, prone to disease, and unnaturally thick.”

- ▶ **STEP 1 Ask yourself, “What happens in the passage?”** (What is the effect?) *Forests become physically deteriorated, likely to contract diseases, and denser than they would naturally.*
- ▶ **STEP 2 Ask, “Why does it happen?”** (What is the cause?) *The lack of fire.*
- ▶ **STEP 3 Rewrite the passage using an explicit cause-and-effect signal word like *cause*, *effect*, or *because*.** Notice that the *cause* is lack of fire; the *effect* is that the pine forests grow senile, prone to disease, and unnaturally thick. *I can infer that the lack of fires causes pine forests to grow senile, prone to disease, and unnaturally thick.*

You can also discover cause-and-effect relationships by paying careful attention to the verbs the writer uses. Certain verbs are **causative verbs**—verbs that express cause-and-effect relationships. For example, here is a sentence from the Yellowstone article: *Fire rejuvenated Yellowstone*. In this sentence, *rejuvenated* is a causative verb meaning “to make seem new or fresh again.” The cause-and-effect relationship is built into the verb *rejuvenated*. Fire is the cause; making Yellowstone seem new or fresh again is the effect of fire. If you are unsure whether a verb is a causative verb, look it up in a dictionary to see whether the verb describes an effect one thing has on another. Here are some other common causative verbs:

| | | | |
|----------|----------|---------|---------|
| contract | destroy | expand | make |
| create | dissolve | inflate | produce |
| darken | energize | lighten | sharpen |

YOUR TURN 2**Identifying Implied Causes and Effects**

Using the steps in Thinking It Through, identify the cause-and-effect relationships in the following passages from the reading selection. It may not be necessary to go through every step for every passage.

1. But today, the forest floor is a sea of green—knee-high lodgepoles planted, literally, by the fires of 1988.
2. What put Yellowstone’s fires out was not retardant-dropping planes or armies of firefighters on the ground. It was a quarter inch of autumn rain.
3. Fire has not repelled tourists; it has attracted them—just as it attracts many species of wildlife.
4. Before 1988, three-toed woodpeckers were almost nonexistent in Yellowstone. After 1988, one ornithologist spotted thirty in one day.
5. Just as fire rejuvenated lodgepoles, so, too, did it revitalize plants that grazing animals eat.



Go to the Chapter Menu for an interactive activity.

Cause-and-Effect Structure**READING FOCUS**

I’m Beginning to Sense a Pattern . . . Newton’s third law of motion says that for every action there is an equal and opposite reaction. The “butterfly” effect, an example of the chaos theory of physics, states that the movement of a butterfly wing somewhere in China can cause a chain reaction of events that affects the weather in California weeks later. With all the actions and “equal and opposite” reactions going on in the world, how can anyone keep up with them? How can you, as a reader, make sense of it all?

Here is one way: try to determine the writer’s **organizational pattern**. For causal analysis, writers generally start with one of three patterns:

- patterns that emphasize causes
- patterns that emphasize effects
- patterns that trace a causal chain

From these simple organizational patterns, writers often develop more complex patterns to describe more complex cause-and-effect relationships. These **composite patterns** show a mixture of two or more of the simple patterns. By identifying the organizational pattern a writer uses, you will be better able to understand and follow the cause-and-effect relationships the writer explains.

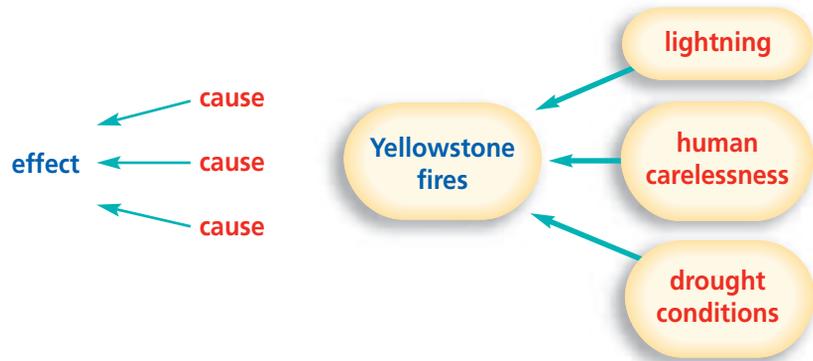
TIP

Sometimes a writer discusses **underlying causes** in an analysis. For example, an obvious cause of a car wreck might be an equipment malfunction, while the underlying cause might be neglected maintenance.

► **Pattern 1: Focus on Causes** Some pieces of writing focus on explaining what has caused a certain event to happen. Writers usually begin these pieces by presenting a clearly observed effect; then, they proceed to analyze the causes that have led to the effect. Sometimes these causes are obvious and easily explained. At other times, a writer will present only *possible* causes, because no one is certain of the exact reasons for the effect.

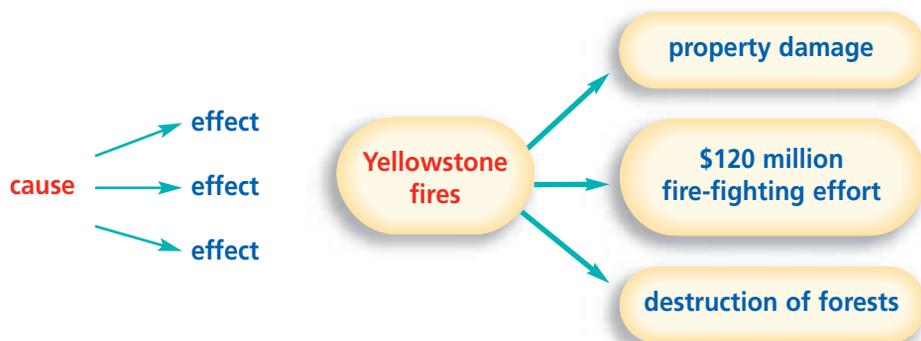
If a piece you are reading focuses on causes, you are likely to find an effect presented in the introductory paragraph as part of the thesis statement. Then, the body paragraphs will explain the causes of the effect.

The following diagram illustrates an example of a “focus on causes” organizational pattern. One cause, drought conditions, is inferred.



► **Pattern 2: Focus on Effects** Sometimes a writer describes a cause and analyzes its effects. If the writer is discussing a recent situation, with effects not yet observed, the writer may speculate about *possible* effects.

In a piece that focuses on effects, you will likely find the cause presented as part of the thesis statement. The effects that result from the cause will be the topics of the piece’s body paragraphs. Much of the Yellowstone article’s focus was on the effects of the fire. The following illustration shows the pattern in which some of the effects are presented in the article.

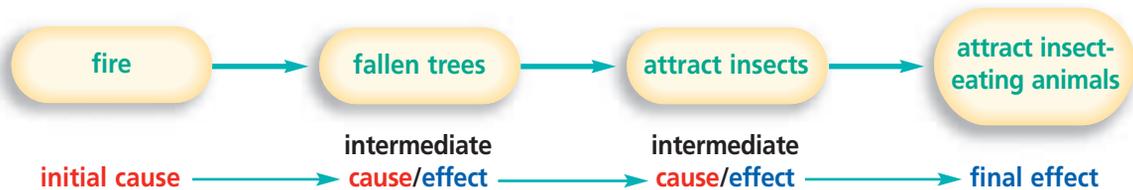


It is important for you as a reader to pay close attention to whether the writer of an article has pointed out both long-term and short-term causes and effects. **Short-term effects** are usually the most immediately identifiable, but **long-term effects** are often the most important. For example, as the article on the Yellowstone fires points out, most people recognized only the short-term destruction caused by the fires. Some saw a once beautiful Yellowstone National Park devastated by fire. Others saw an end to businesses that thrived on tourism. However, the long-term *positive* effects of rejuvenation turned out to be more important (and more surprising), although several years passed before they became obvious. The diagram below illustrates both the long- and short-term effects.

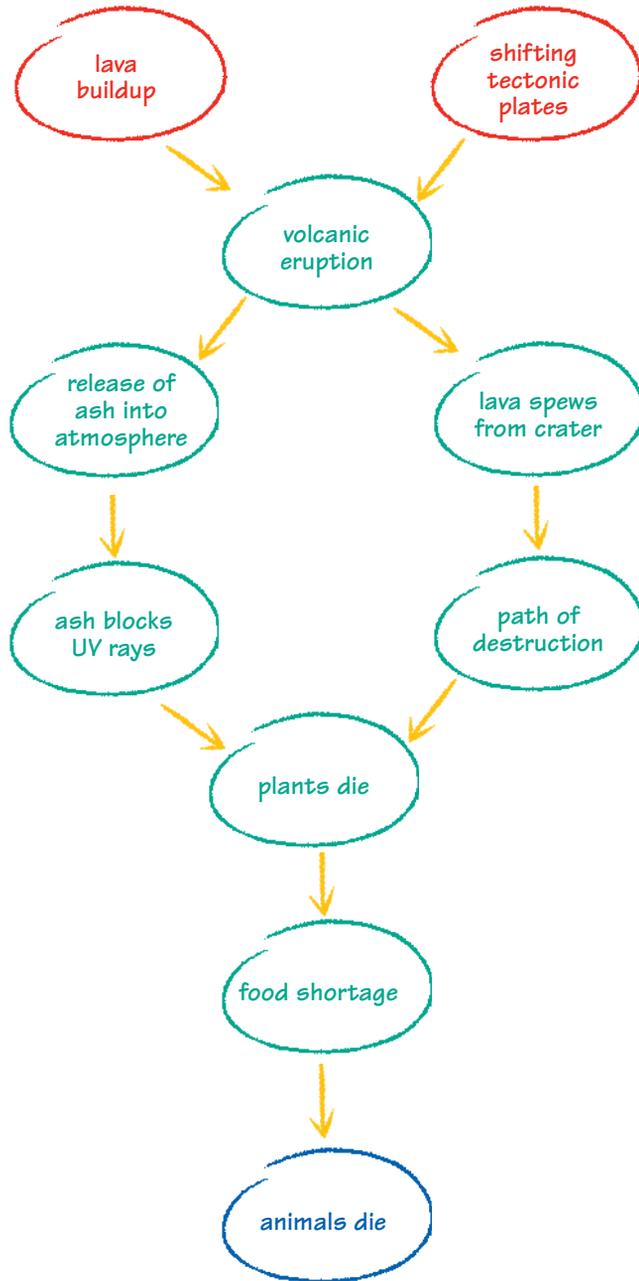


► **Pattern 3: Causal Chain** A causal chain is like a row of toppling dominoes—one event causing another, repeated until a final effect is reached. The event that begins a causal chain—known as the **initial cause**—is followed by an effect that becomes the cause of another effect. This process is repeated until the **final effect**—the effect that ends the chain—is reached. Each **intermediate** (in-between) **cause** or **effect** is like a link in a chain. Though one link may not be as important or as strong as the other links, they are all necessary to the chain. If just one of these intermediate causes were absent, the final effect would not be reached.

Typically, you will find an initial cause stated in the thesis of an article. Within the body of the article, you will then read explanations of each link in the chain of events through the final effect. In the Yellowstone article, you probably noticed that the writer discussed a few causal chains. This diagram shows part of a causal chain from that article.



► **Pattern 4: The Composite Pattern** When you read a causal analysis, you may not always find a single organizational pattern that covers all the information given. A situation or process may be too complicated to be effectively described using a simple pattern. The following diagram illustrates a composite cause-and-effect pattern that explains the relationship between causes and effects in a volcanic eruption.

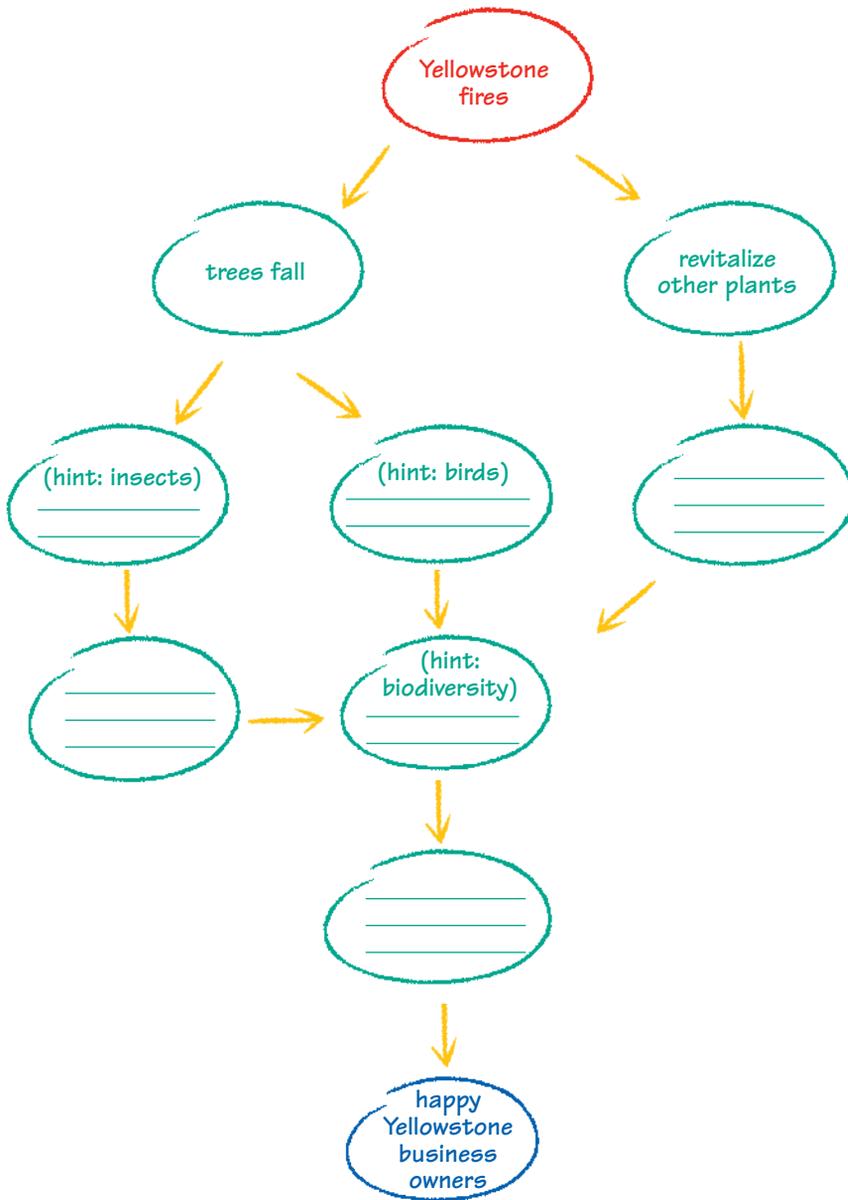


YOUR TURN 3

Analyzing Cause-and-Effect Structure

To analyze the complex cause-and-effect relationships in “Yellowstone Makes a Triumphant Return,” redraw and fill in the causal-chain diagram below. Draw a red circle around the initial cause, green circles around the intermediate causes, and a blue circle around the final effect. Identify at least one long-term and one short-term effect.

Go to the Chapter Menu for an interactive activity.



MINI-LESSON VOCABULARY

Suffixes

When you read complicated cause-and-effect explanations like Bruce Babbitt's article on the Yellowstone fires of 1988, you might run into some unfamiliar words. One way to prepare yourself to identify the meanings of unfamiliar words is to learn some basic suffixes. A **suffix**, a word part of one or more syllables, is added to the end of a word to alter its meaning or to change its part of speech. The suffixes in the chart at right often act as indicators of changes, causes, or effects.

| Suffix | Meaning | Example |
|--------|-----------------------|------------------|
| -ate | become, cause | activate |
| -ation | the result of ____ing | summation |
| -en | cause to be, become | cheapen |
| -fic | making, causing | horrific |
| -ic | caused by | acidic; choleric |
| -ize | make, cause to be | terrorize |

THINKING IT THROUGH

Using Suffixes

Use these steps to figure out the meanings of many words with suffixes.

- ▶ **STEP 1** Write the word down, but put a long dash between the root and the suffix. Suppose you needed to figure out the meaning of the word *compilation*. *compil—ation*
- ▶ **STEP 2** Write down a known word that has the same suffix. *relaxation*
- ▶ **STEP 3** Write down everything you know about the known word and about the suffix. *Relaxation* means taking a break, or relaxing. Based on the meaning of the suffix *-ation*, it means "the result of *relaxing*."
- ▶ **STEP 4** Now, use what you know to make an inference—an educated guess—about the definition of the unfamiliar word. If *relaxation* is the result of *relaxing*, then *compilation* must be the result of *compiling*. For example, when a music group puts out a compilation disc, it must be the result of compiling, or gathering together, all their best songs.

Be careful, though; many suffixes have multiple meanings. For example, *-ic* can also mean "like," as in the word *angelic*.

PRACTICE

Using the steps in Thinking It Through, above, write definitions for the words at right. Then, look up the words in a dictionary to check the accuracy of your definitions.

1. horrific
2. revitalize
3. rejuvenate
4. terrific
5. blacken

**MINI-
LESSON TEST TAKING**

Inferring Causes and Effects

Reading tests often measure your ability to infer, or make an educated guess about, causes or effects not directly stated in a reading passage. Because inference reading passages will not include clue words or phrases such as *because* or *as a result*, you must figure out the cause-and-effect relationship within them yourself.

Here is a typical reading passage and test question:

Damage by pollution to ecosystems can be slow but sure. Acid rain, for instance, changes the quality of the water in ponds and streams. When frogs and toads lay eggs in acidic water, fewer of their offspring reach maturity. When there are fewer frogs and toads, the insect popula-

tion explodes. The insects, in turn, feed on plants and crops, which may prompt farmers and gardeners to use more pesticides. These pesticides can eventually get washed by rain into waterways, where they might create further problems.

1. From this paragraph, what can you infer about the effects of frogs and toads on their ecosystems?
 - A. American factories are the largest cause of acid rain.
 - B. Frogs and toads help to keep insect populations down.
 - C. Fish, which eat tadpoles, suffer when frog and toad populations decline.
 - D. Frogs and toads eat plants and crops.

**THINKING IT
THROUGH**

Inferring Causes and Effects

Use the following steps to answer cause-and-effect inference test questions like the sample question above.

- ▶ **STEP 1** Skim the passage once for a general understanding; then re-read it carefully. Keep in mind that most of these questions are designed to measure your reading comprehension, not your reading speed.
- ▶ **STEP 2** Locate key words and phrases in the sample answers that match similar words and phrases in the reading passage. Answers A and C share few key words with the reading passage. The reading passage does not mention *factories* or *fish*. Answers B and D contain key words which are in the reading passage.
- ▶ **STEP 3** Apply your knowledge to the remaining answers. The passage states that *insects* (not frogs and toads) eat plants and crops, so D is wrong. Your knowledge that frogs and toads eat large numbers of insects confirms that B is correct.