

Glencoe Science

Reading and Writing Skill Activities

Student Edition



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Activity

1

IRA/NCTE

Standard 1

Directions: Read the magazine article below, then answer the questions.

Cerro Grande Forest Fire Not What Was Prescribed

June 20, 2000—On May 5, a fire intentionally set by the National Park Service at Bandelier National Monument in New Mexico began burning out of control. What began as a prescribed burn became Cerro Grande fire—one of the worst fires in New Mexico’s history. The fire was prescribed to remove brush and undergrowth in parts of the forest. By burning away this wildfire “fuel,” the Park Service hoped to prevent a natural, uncontrollable wildfire from occurring. It also hoped to restore the natural cycle of fire necessary for forests to survive.

Forest fires can serve a purpose. The variety of plants in an area is often ten times greater after a wildfire because of the nutrient-rich soil that fires can produce. Fires burn mineral-storing parts of plants into ash. Rain or snow dissolves the ash into the soil, providing essential minerals to the soil. Some plants even depend on fire for survival. Many pine trees cannot reproduce without the help of fire. Their cones will not open and release seeds unless heated.

Many natural forest fires are started by lightning. However, it is common practice for the National Park Service to prescribe burns such as the one in New Mexico. Unfortunately in this case, good intentions had devastating results. Strong winds and hot weather caused the fire to spread rapidly, making it difficult to contain. By May 10, the fire had consumed more than 7,200 hectares of land. It also had destroyed many homes along the edge of the forest near Los Alamos, New Mexico. Thousands of people had to be evacuated. Embers from the fire were being carried up to a mile away by the wind, causing spot fires to erupt. When the fire was finally contained on June 6, it had burned almost 20,000 hectares of land, more than 200 homes, and caused more than \$1 billion in damage.

Time will tell whether the forest will ultimately benefit from the fire or be forever damaged. The enormous amount of damage might outweigh any benefits. Most certainly, the lives of the people who watched the fire swallow up so much of the land have been forever changed.

Multiple Choice

1. What does the word *prescribed* mean in “prescribed burn”?
 - a. to order
 - b. to outlaw
 - c. to give medical advice
 - d. to claim a right to
2. Which is an opinion from the article?
 - a. Many pine trees cannot reproduce without the help of fire.
 - b. By June 6, the fire had consumed more than 20,000 hectares of land.
 - c. Most certainly, the lives of the people who watched the fire swallow up so much of the land have been forever changed.
 - d. Many natural forest fires are started by lightning.
3. What is a spot fire?
 - a. a smaller fire burning in the middle of the main fire
 - b. a fire set on the boundaries of a wildfire to control it
 - c. a fire started away from the main wildfire by embers from it
 - d. a fire intentionally set to control undergrowth and brush

Activity 1 (continued)**Short
Answer**

4. What caused the Cerro Grande fire to consume so much land so quickly?
 - a. too much undergrowth
 - b. spot fires erupting
 - c. heavy rain
 - d. strong winds

5. What is the author's attitude toward the National Park Service? Use information from the article to support your answer.

6. How would the article change if the author was writing it for a newspaper in Los Alamos, where many people lost their homes?

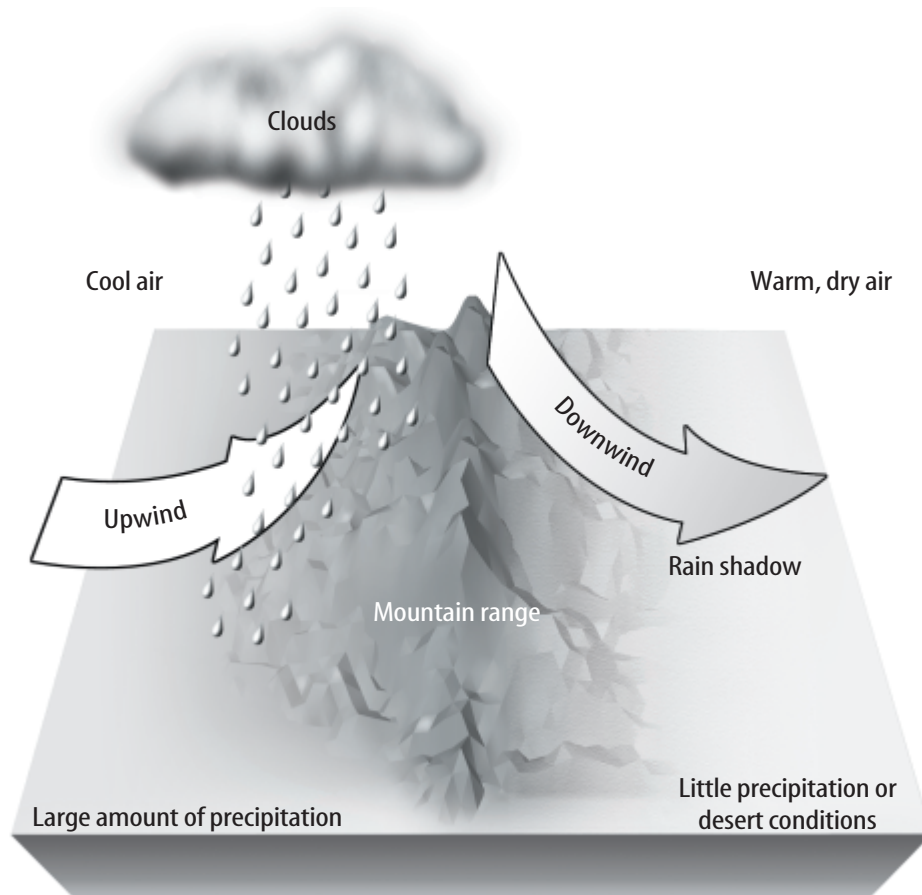
Activity**2****IRA/NCTE****Standard 1**

Directions: Read the passage below and examine the diagram. Then answer the questions.

A rain shadow is an area that receives little rainfall because it is on the downwind side of a mountain or mountain range. When winds encounter a mountain, air is forced to go up and over the mountain. As the air rises, it expands and cools. Cool air is unable to hold as much moisture as warm air, so the moisture often condenses, forming clouds. Precipitation then falls from the clouds on the upwind side of the mountain.

As air moves over the mountains and begins to descend on the downwind side, it becomes warmer. Clouds do not form easily in the warmer air. Because the warm, dry winds on the downwind side of the mountains produce very little precipitation, this area is called the rain shadow. In some parts of the world, rain shadow areas have become deserts because they receive so little rainfall. California's Death Valley is part of a rain shadow.

The following diagram illustrates how a rain shadow occurs.



Activity 2 (continued)**Multiple
Choice**

1. What causes clouds to form on the upwind side of mountain ranges?
 - a. The warm winds cause moisture to condense, forming clouds.
 - b. The mountains keep the air from circulating, forming clouds.
 - c. The strong winds push the air into the mountains, forming clouds.
 - d. The air rises and cools as it hits the mountain, forming clouds.
2. Land in a rain shadow area most likely would
 - a. be covered with thick forests.
 - b. be desert.
 - c. have many lakes.
 - d. be used for farming.
3. Why did the author write this passage?
 - a. to discuss how clouds form
 - b. to tell how deserts are formed
 - c. to give information about rain shadows
 - d. to explain how mountains affect weather
4. Which detail is NOT supported in the passage?
 - a. Some rain shadows are deserts.
 - b. Death Valley is in California.
 - c. Air cools and expands as it rises.
 - d. The downwind side receives more precipitation.

**Short
Answer**

5. What three questions could you ask someone to determine whether they live in a rain shadow?

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6. Do you think a written explanation or a detailed drawing is most useful in explaining rain shadows? Explain.

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Activity

3

IRA/NCTE

Standard 1

Directions: Read the passage below, then complete the writing activity that follows.

Keiko the killer whale, was the star of the *Free Willy* movies released in the 1990s. In 1996, it was revealed that Keiko was living in a cramped tank of warm water at an amusement park in Mexico. He was very sick. He captured the hearts of thousands of young people and environmentalists, who banded together to help him regain his freedom. He was moved to the Oregon Coast Aquarium to be rehabilitated. Once healthy, he was moved to an open-water pen in Klettsvik Bay off southern Iceland in 1998. The goal was to release him as soon as he was prepared to return to the wild. His crew of caretakers took him on several ocean “walks” to get him ready for his return to the sea.

When Keiko was finally granted his freedom, he refused to swim away. When his caretakers escorted him to the open seas, Keiko always returned. Because he has depended on humans for 20 years, Keiko had trouble readjusting to life in the wild. Hallur Hallsson, a spokesperson for the organization that cares for Keiko said, “It is likely that he will remain in captivity until the end of his life.”

What is your reaction to Keiko’s plight? Do you think people were justified in helping him win his freedom? Do you think they were disappointed when they learned he did not want to return to the wild? Write three personal journal entries that might have been written by someone who was involved in the “Free Willy” campaign.

1. The first entry should be written on the day that person decided to join the campaign.
2. The second entry should be written after Keiko’s successful relocation to Iceland.
3. The third should be written after it was announced that Keiko showed no desire to return to the wild.

Activity

4

IRA/NCTE

Standard 2

Directions: Read the two newspaper articles below, then answer the questions.

Navy Sonar May Be Responsible for Beached Whales

March 16— In the past two days, at least 16 whales have beached themselves on the shores of three islands in the Bahamas. Concerned bystanders were able to push some of the 12-foot to 15-foot whales back into the water, but seven of the whales have died.

Although the cause has not been determined, some scientists think that tests being conducted by the U.S. Navy in the area might be the cause of the whale's strange behavior. The ships were using sonar to detect submarines. Whales are highly sensitive to sound, and very loud noises created by the sonar tests could have disoriented the whales and even caused ear damage. Scientists said they will investigate to find the cause of the strange behavior. They plan to conduct necropsies on some of the whales to determine the cause of their deaths.

Report Released on Dead Whales

June 14— Marine biologists reported today that the seven whales who died last March in the Bahamas probably were disoriented by a “distant explosion or an intense acoustic event.” The loud noise caused bleeding and damage to the tissues around the whales' inner ears, disorienting them and causing them to swim ashore.

Biologist Darlene Ketten of the National Marine Fisheries Service said that there might be a link between the death of the whales and the sound generated by Navy sonar tests, but she cannot say for sure. One possibility is that the loud noise was caused by an underwater landslide in the area.

According to the report, except for damage to their ears, the whales were healthy and free from disease. Whatever the cause, a Navy spokesperson said, “We hope to build upon what we will learn . . . to ensure that it does not happen again anywhere in the world.”

Multiple Choice

1. What newsworthy event was the reporter writing about in these two articles?
 - a. Seven whales died mysteriously.
 - b. The Navy was conducting sonar testing.
 - c. Research shows that whales are sensitive to sound.
 - d. Scientists are performing tests on dead whales.
2. Most readers might infer from the first article that
 - a. the whales died of natural causes.
 - b. Navy sonar tests were probably responsible for the whales' deaths.
 - c. these whales are on the endangered species list.
 - d. the Navy is not responsible for the death of the whales.
3. In the last sentence of the first article, what does the word *necropsies* mean?
 - a. written reports provided to government agencies
 - b. medical examinations to determine cause of death
 - c. X rays of vital organs
 - d. underwater studies conducted on marine animals and plants

Activity 4 (continued)**Short
Answer**

4. Which of the following statements is NOT presented as a fact in either article?
- a. Navy sonar tests caused the death of the whales.
 - b. Seven whales died in the Bahamas.
 - c. Whales are sensitive to sound.
 - d. Some of the whales examined had damage to their inner ears.

5. Do you think the Navy tests were responsible for the whales' deaths? Use information from the two articles to support your opinion.

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6. What might be different about these two articles if the reporter was writing them for a team of marine biologists?

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Activity

6

IRA/NCTE

Standard 3

Directions: Read the passage below, then answer the questions.

The U. S. space program got a boost in 1997 with the Mars Pathfinder mission. Thousands of people watched as the Sojourner rover landed on Mars. The tiny rover, just 11 kg in weight and 0.6 m in length, could be controlled remotely from Earth. The goal of the mission was to study the environment of Mars. The rover gathered data on soil and rocks on the surface of Mars. It sent back incredible pictures of the Martian surface.

The Mars Pathfinder mission is part of NASA's Discovery missions—low-cost missions to explore Mars. But just how low is the cost? The Mars Surveyor '98 space program cost \$193.1 million to develop, another \$91.7 million to launch, and \$42.8 million to run. This is a hefty price tag for a mission that failed.

The Mars Surveyor '98 was made up of two spacecraft—the *Mars Climate Orbiter* and the *Mars Polar Lander*. The Climate Orbiter reached Mars in September 23, 1999. It was scheduled to pass behind Mars and then reestablish radio contact with Earth. But no radio signal was ever received. Scientists think a mix-up of English and metric measurements caused the Orbiter to get too close to Mars and burn up in its atmosphere.

The *Mars Polar Lander* encountered a similar fate just months later when it disappeared on December 3, 1999. Its mission was to search for water and ice at Mars' south pole. But communication was lost and it's not known whether it ever landed on the planet. A report on the mission assumes that the Lander crashed into the surface of Mars. Apparently, the legs of the Lander interfered with communications. This led scientists to believe that it had landed, so they turned off the engines, making it impossible for it to land safely.

The two lost spacecraft were valued at \$320 million. It's time to reexamine our goals in space exploration and determine whether or not it's worth the price. We cannot continue to invest dollars in space programs and receive nothing in return.

**Multiple
Choice**

1. Which two spacecraft on the Mars Surveyor '98 were lost?
 - a. *Polar Lander* and *Climate Orbiter*
 - b. *Climate Orbiter* and *Sojourner*
 - c. *Pathfinder* and *Polar Lander*
 - d. *Climate Orbiter* and *Pathfinder*
2. What was NASA's first clue that the *Climate Orbiter* might be in trouble?
 - a. It did not reestablish radio contact after passing behind Mars.
 - b. It was orbiting too close to Mars.
 - c. The engines were turned off.
 - d. The rover sent back pictures of the mishap.
3. Where would an article like the one you just read most likely be published?
 - a. in an encyclopedia
 - b. on the editorial page of a newspaper
 - c. in a factual report written by NASA engineers
 - d. in a letter to members of Congress to gather support for the space program

Activity 6 (continued)**Short
Answer**

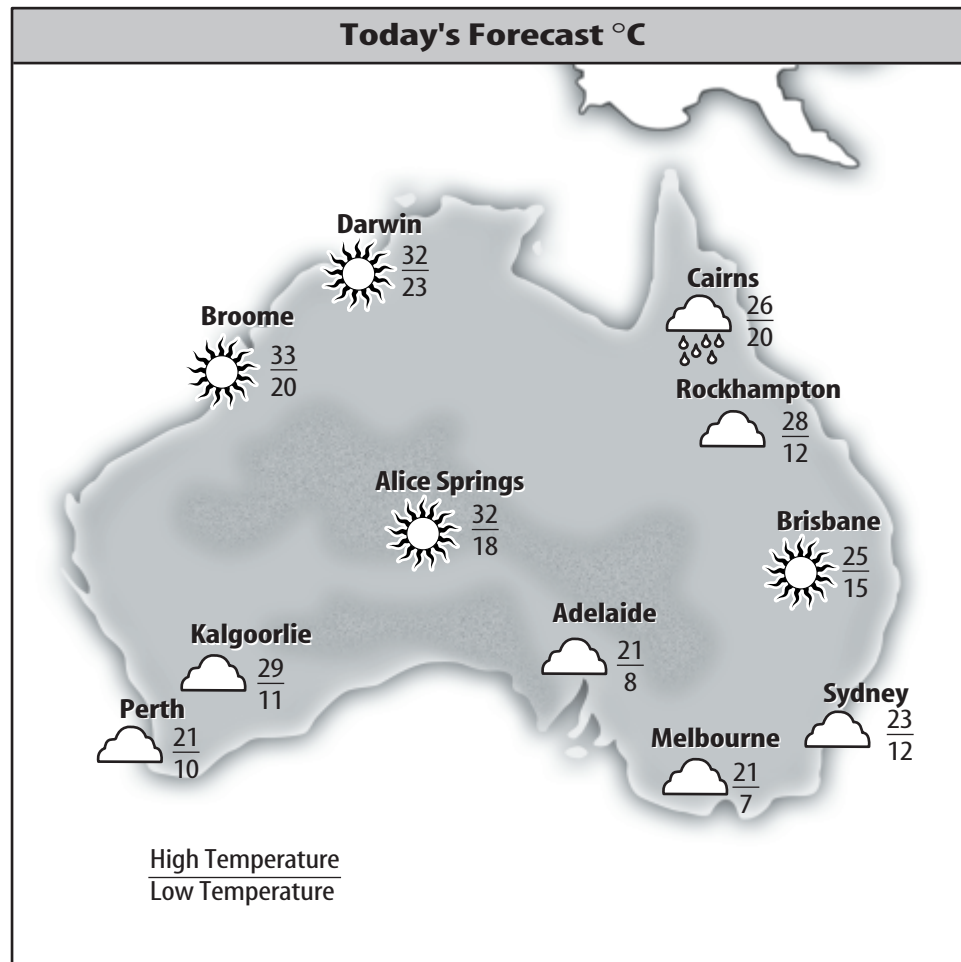
4. Which of these statements from the article is NOT an opinion?
 - a. It's time to reexamine our goals in space exploration and determine whether or not it's worth the price.
 - b. We cannot continue to invest dollars in space programs and receive nothing in return.
 - c. The two lost spacecraft were valued at \$320 million.
 - d. This is a hefty price tag for a mission that failed.

5. In the last sentence, the author writes, "We cannot continue to invest dollars in space programs and receive nothing in return." Do you agree with this statement? Explain.

6. How do you think a group of NASA engineers who worked on this mission might respond to this article?

Activity**7****IRA/NCTE****Standard 3**

Directions: *Examine the map and read the weather report. Then answer the questions.*



The forecast for today calls for fairly warm temperatures around much of Australia. The temperatures will stay in the low 30s for much of northwest Australia. Those areas also can expect continued sun. Clouds cover much of the rest of the country with the Sun peaking through only occasionally. You'll want to carry an umbrella in Cairns and a light jacket along much of the southern coast, as the low temperatures will dip into the 30s. All in all, expect a beautiful spring day and much of the same throughout the rest of the week.

Activity 7 (continued)**Multiple
Choice**

1. If the map is correct, what is the one incorrect fact in the weather report?
 - a. Northwest Australia will have temperatures in the 30s.
 - b. You'll want to carry an umbrella in Cairns.
 - c. You'll want to carry a light jacket along much of the southern coast.
 - d. Overnight temperatures on the southern coast will dip into the 30s.
2. Most people who live in Alice Springs probably will wear
 - a. long sleeves and pants.
 - b. shorts and a tank top.
 - c. a sweatshirt and shorts.
 - d. long pants and a T-shirt.
3. What is the expected low temperature in Adelaide?
 - a. 21
 - b. 8
 - c. 12
 - d. 23
4. You most likely would find a weather map with today's forecast in
 - a. an almanac.
 - b. an encyclopedia.
 - c. a newspaper.
 - d. a magazine.

**Short
Answer**

5. This weather report was written to inform but it is written in a friendly, informal tone. Give an example of one or two words or phrases that help to make the report reader-friendly.
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6. The weather report states, "all in all, expect a beautiful spring day." Write at least one detail from the passage that does NOT support this idea.
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Activity

8

IRA/NCTE

Standard 4

Directions: Read the article below, then answer the questions.

On the Edge of Extinction

In 1900, there were an estimated 100,000 tigers on Earth. Today, only between 5,000 and 7,500 remain. Total extinction of tigers by 2010 is a very real threat.

Why are tigers disappearing? The criminal act of poaching is the main reason. Poaching is illegal, but it is very profitable. Tiger parts are worth large amounts of money. The parts of a single tiger can be worth \$5 million. In the past, the hide of the tiger was a great prize; now the prize is the tiger's bones. The bones are used to make many traditional Asian medicines. Many of these medicines are exported from Asia, some of them to the United States. In 1950, about 4,000 South China tigers lived in the wild. By 1998, this number had dropped to less than 30 wild tigers.

Even though the U. S. Congress passed legislation to stop the import of tiger parts, poachers continue to get around the rules. They smuggle tiger parts in with other legal products. The United

States has fewer than 100 wildlife inspectors to check products coming into the country. It is not difficult to get tiger parts into the country without being caught. Even when inspectors find medicines made with tiger bones, they cannot always prove it. The high temperature needed to make the medicines makes it impossible to tell whether the bone was that of a tiger or another animal.

You would expect most tiger products to be sold in secret in the United States. Many of them are sold openly in small medicine shops in some of the nation's larger cities. The demand for the products is great enough to outweigh the risk of getting caught selling them.

Some groups are working to decrease the number of tiger products sold, by helping find other options. For example, the bones of wild mole rats, a species that is abundant, have been used to make medicines. Finding alternatives to create less demand for tiger parts is one of the first steps to ending tiger poaching.

Multiple Choice

1. The main idea of this article is that
 - a. poaching tigers is illegal.
 - b. tiger bones are used in medicine.
 - c. more needs to be done to stop the poaching of tigers.
 - d. poachers smuggle tiger parts into the United States.
2. This passage does NOT discuss
 - a. where tiger medicines are sold in the United States.
 - b. how tiger parts are exported from Asia.
 - c. alternatives to using tiger bones in medicine.
 - d. the number of tigers living in the wild.
3. Why did the author write this passage?
 - a. to show people how to smuggle tiger parts
 - b. to tell people where to find tiger medicines
 - c. to inform people about tiger poaching
 - d. to tell people which tiger part to use for laziness

Activity

10

IRA/NCTE

Standard 5

Directions: Read the passage below, then answer the questions.

Ice sheets are huge masses of ice that form in some places where snow falls faster than it can melt. The world's second largest ice sheet is the 1.8 million-square-km sheet of ice that covers most of Greenland. Gravity causes the ice to flow from higher elevations at the center of the ice sheet to lower elevations at the edges. In some places, the ice reaches the sea where it breaks off and forms icebergs.

Recently it has become possible to directly measure whether parts of the ice sheet are thickening or thinning. Researchers from NASA and other places used a laser mounted on an airplane to measure the height of the southern part of the ice sheet surface in 1993 and 1994, and again in 1998. Their results showed that while much of the ice sheet was thickening slowly, near the southeastern coast the ice sheet was thinning by as much as several meters per year.

The size of the measured thinning was surprising. One possible explanation is that the ice is thinning in response to a warming climate. Since the last part of the nineteenth century, Earth's mean temperature has increased by about 1°C. Measurements show that the 1990s were the warmest decade of the past 100 years, while 1998 was the warmest year since 1860. This increase in Earth's average temperature often is called global warming. Global warming may be causing part of the ice sheet to thin.

Some scientists suspect that global warming may be caused by an increase in greenhouse gases in Earth's atmosphere. Burning fossil fuels produces the greenhouse gas carbon dioxide. Measurements show that the amount of carbon dioxide in the atmosphere has been increasing since the middle of the eighteenth century. Global warming has been occurring over the time that carbon dioxide levels have been rising.

If global warming caused the Greenland ice sheet to completely melt, the result could be catastrophic. The ice sheet contains enough ice to raise the level of the ocean by about 6 m if it were completely melted. If this were to happen, coastal cities throughout the world, such as New York City, would experience massive flooding.

**Multiple
Choice**

1. According to the passage, what might be causing part of the Greenland ice sheet to thin?
 - a. too little snow
 - b. global warming
 - c. carbon dioxide
 - d. rising sea levels
2. What is the definition of the word *mean* in the third paragraph?
 - a. average
 - b. lowest
 - c. highest
 - d. Fahrenheit

Activity 10 (continued)

3. What is the author's attitude about global warming?
 - a. The author thinks it will not change Earth's climate.
 - b. The author thinks it is only a theory.
 - c. The author does not take it seriously.
 - d. The author thinks it has occurred.
4. This passage suggests that what is happening in Greenland
 - a. will cause the Greenland ice sheet to disappear.
 - b. should not be a concern for scientists.
 - c. might be due to global warming.
 - d. will increase Earth's temperature.
5. How did researchers measure the thickening and thinning of the ice sheet?

**Short
Answer**

6. Why do you think the author wrote this passage? If the last paragraph of the passage was deleted would your response be the same? Explain.

Activity

11

IRA/NCTE

Standard 5

Directions: Read the travel brochure below, then answer the questions.

Canyon Rock Tours South Rim Drive

(555) 602-7548

“A unique look at the Grand Canyon from a geologist’s perspective.”

Let our professional geologists give you the most
informative Grand Canyon tour available.

The Rocks

Learn about the amazing history of the Grand Canyon by looking at its many layers of rock. See trace fossils of animals and plants that lived millions of years ago. Touch Precambrian rocks that are 2 billion years old. Find out which minerals give the rock layers their colors of red, yellow, and green.

The Formations

Visit different rock formations and witness how erosion and weathering have shaped one of the world’s most beautiful canyons.

The Views

Enjoy your lunch break at Yavapai Observation Station. The station overlooks the canyon with a view that is breathtaking and unforgettable.

- Tours depart every day, except Sunday, at 9 A.M. from the Grand Canyon Village Visitor Center. Tours return around 5 P.M.
- Cost is \$30 per person.
- Be sure to pack a sack lunch and bring plenty of drinking water.
- This tour involves extensive hiking and requires some rock-climbing experience. Please dress in layers and wear appropriate shoes.

Note: Reservations are required at least two days in advance for groups of six or more.

Multiple Choice

1. Which of the following statements from this brochure is a form of bias?
 - a. Find out which minerals give the rock layers their colors of red, yellow, and green.
 - b. Let our professional geologists give you the most informative Grand Canyon tour available.
 - c. Touch Precambrian rocks that are 2 billion years old.
 - d. Cost is \$30 per person.
2. Which shoes would be most appropriate for this tour?
 - a. sneakers
 - b. sandals
 - c. dress shoes
 - d. hiking boots

Activity 11 (continued)**Short
Answer**

3. Tourists are required to make reservations at least two days in advance if
 - a. they have a group of six or more people.
 - b. they want to go on a certain day.
 - c. they do not want to pack a lunch.
 - d. they would like a private tour.
4. Who would be most likely to take this tour?
 - a. people who want to see the Colorado River
 - b. people who do not like to hike
 - c. people who are interested in rocks
 - d. people who want to hike across the Grand Canyon

5. Your 70-year-old grandfather, who uses a wheelchair, did not get a chance to see this brochure. He's interested in geology and thinks he'd like to go on the tour Sunday at 11 A.M. He's willing to spend up to \$25. He asked you if the tour is a good choice for him. What do you tell him? Explain your answer using details from the brochure.

6. The brochure contains factual information and opinions. List one opinion from the brochure and explain what makes it an opinion.

Activity

13

IRA/NCTE

Standard 6

Directions: Read the passage below, then answer the questions.

In the United States, 33 million people become sick each year from food-borne illnesses and 5,000 to 9,000 people die. One way to make foods safer is to expose them to radiation. This process, called irradiation, kills harmful bacteria and parasites and slows spoilage. Some people do not approve of the use of irradiation. They say its safety has not been proved. Those who support its use say it will make safe food available to more people. The World Health Organization, an agency that sets global standards for health, supports irradiation as a way of protecting the public's health.

**Multiple
Choice**

1. Which of the following sentences would be the best topic sentence for this paragraph?
 - a. Radiation is energy that travels by waves in all directions from its source.
 - b. Food poisoning is a real problem.
 - c. In 1930, a French scientist patented a process of irradiation.
 - d. The bacterium that causes botulism is *clostridium botulinum*.
2. Which of the following sentences contains a misspelled word?
 - a. One way to make foods safer is to expose them to radiation.
 - b. They say its safety has not been proved.
 - c. The World Health Organization, an agency that sets global standards for health, supports irradiation as a way of protecting the public's health.
 - d. Those who support its use say it will make safe food available to more people.
3. What is the subject of the sentence: The World Health Organization, an agency that sets global standards for health, supports irradiation as a way of protecting the public's health.
 - a. The World Health Organization
 - b. agency
 - c. health
 - d. irradiation
4. If you divided this paragraph into two paragraphs, which sentence would you choose to be the first sentence of your second paragraph?
 - a. Some people do not approve of the use of irradiation.
 - b. They say its safety has not been proved.
 - c. This process, called irradiation, kills harmful bacteria and parasites and slows spoilage.
 - d. One way to make foods safer is to expose them to radiation.

Activity 13 (continued)**Short
Answer**

5. Create two simple sentences from one of the compound sentences in the passage.

6. If you wanted to develop this paragraph into a more complete article, list three topics you would develop further.

Activity

15

IRA/NCTE

Standard 7

Directions: Read the passage below, then answer the questions.

Chesapeake Bay is the largest estuary in the United States. An estuary is a body of water along a coast in which river and seawater mix. More than 100,000 streams and rivers drain into the Chesapeake Bay from Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia. Its watershed, or drainage basin, covers 26 hectares. More than 15 million people live in the watershed. This huge population has had a great impact on the bay and its plants and animals.

Everything that happens in the watershed affects the bay. The same rivers and streams that drain into the bay also add pollutants. Some pollutants take a very indirect route. For example, a farmer might spray a pesticide on his field. A thunderstorm then could wash some of that pesticide into a creek. The creek could flow into a river and the river into the bay, carrying the pesticide pollutants with it.

Pollutants also can take a direct route to the bay. Many wastewater treatment plants release effluent into the bay. Effluent is water with waste material in it. Effluent contains an excess of two nutrients—nitrogen and phosphorus. Although these nutrients are necessary for life, they can be very harmful to the bay. They cause algae in the water to grow out of control. This sudden explosion of algae is called an algal bloom. Algal blooms block the sun and cause underwater plants to die. This has a ripple effect on the animals in the estuary that depend on the underwater plants for food. When the algae dies and begins to decompose, it also uses up precious oxygen supplies, causing fish and other living things to die.

The good news for the bay is that people are trying to save it. In 1983, the states in the watershed, as well as the Environmental Protection Agency, signed an agreement to protect the bay. They signed a similar agreement in 1987 and again in 2000. As part of the agreement, effluent entering Chesapeake Bay is treated before it's released. This is one way of reducing the amount of nitrogen and phosphorus that enters the bay. More people also are becoming aware of how their actions directly affect the bay. Cleanup efforts and environmental awareness are having a positive effect on the bay.

**Multiple
Choice**

1. The best synonym for the term *effluent* is
 - a. algal bloom.
 - b. watershed.
 - c. waste material.
 - d. estuary.
2. What is the main cause of algal blooms?
 - a. untreated wastewater
 - b. excess nitrogen and phosphorus
 - c. runoff water from thunderstorms
 - d. too little oxygen in the water

Activity 15 (continued)

3. When was the first Chesapeake Bay agreement signed?
 - a. 1983
 - b. 1987
 - c. 1993
 - d. 2000
4. Which of the following is not directly stated in the passage but can be inferred?
 - a. People should think about how things they do affect the bay.
 - b. Wastewater treatment plants should pay to clean up the bay.
 - c. Farmers are causing the most pollution in the bay.
 - d. Pesticides should not be used by states that border the bay.
5. Give an example of how a pollutant from 300 km away might get into Chesapeake Bay.

**Short
Answer**

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6. Name one thing that people living in the Chesapeake Bay watershed can do to help protect the bay.

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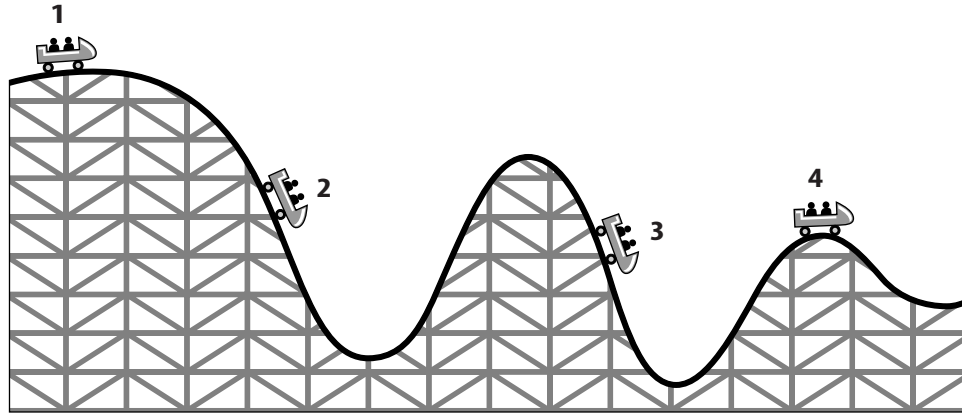
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Activity**18****IRA/NCTE****Standard 8**

Directions: Examine the diagram and read the description that follows. Then answer the questions.



Roller coasters are among the most popular amusement park rides. They are exhilarating and thrilling to the people who ride them. How a roller coaster works is quite simple.

1. Almost all roller coasters start by going up a hill. The coaster is pulled up the hill by a moving chain. A motor provides the energy for the moving chain. The energy from the motor is transferred to the coaster.
2. At the top of the hill, the coaster has stored energy. It has the most stored energy on the first hill. As the coaster goes over the top of the hill, the chain is released and the coaster falls freely on the tracks.
3. As the coaster moves rapidly down the first hill, its stored energy changes into energy of motion, or kinetic energy. It has kinetic energy because it is moving. This kinetic energy carries it to the top of the next hill.
4. The kinetic energy is converted back into stored energy when the coaster reaches the top of the second hill. As it goes down the second hill, the stored energy is again changed into kinetic energy. This happens over and over on each hill until the coaster reaches the station and is stopped by the coaster's operator.

Note: Each hill of a roller coaster must be smaller than the one before it for the coaster to have enough energy to make it over all of the hills. The coaster loses some of its energy between hills because of track friction and air resistance.

Multiple Choice

1. Which number on the diagram shows the roller coaster at the point where it has the most stored energy?
 - a. 1
 - b. 2
 - c. 3
 - d. 4

Activity 18 (continued)**Multiple
Choice**

2. Which statement from the passage is an opinion?
 - a. A motor provides the energy for the moving chain.
 - b. Almost all roller coasters start by going up a hill.
 - c. They are exhilarating and thrilling to the people who ride them.
 - d. The energy from the motor is transferred to the coaster.
3. Where would you be most likely to find this passage?
 - a. in a chemistry book
 - b. in an almanac
 - c. in a physics book
 - d. in a dictionary
4. What is the meaning of the word *friction* in the note at the end of the passage?
 - a. floating
 - b. rubbing
 - c. slipping
 - d. gliding
5. Name two places you could look to find information on kinetic and stored energy.
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**Short
Answer**

6. Predict what would happen if the third hill on a roller coaster ride were bigger than the first hill. Explain your answer.
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Activity

19

IRA/NCTE

Standard 9

Directions: Read the passage below, then answer the questions.

For thousands of years, people throughout the world have used plants to treat illness. Ethnobotanists—scientists who study the plant knowledge of native cultures—have made many discoveries that led to the development of important medicines we use today. In fact, one fourth of all prescription drugs in the United States have plant chemicals as an active ingredient.

In the early 1600s, a European monk saw Native Americans in the Andes Mountains grind the roots, bark, and branches of the cinchona tree. They used the finely ground powder they called “fever bark” to treat high body temperatures. The fever-reducing ingredient in the plant is called quinine, from the Spanish word *quinaquina*. Today, an artificial form of quinine is used in controlling the recurrence of a disease called malaria.

The commonly used drug, aspirin, came from a plant called queen of the meadow. Many years ago, the roots of the plant were boiled. People drank the “tea” containing salicylic acid as a treatment for fever and pain. Today, we use a synthetic form of aspirin with the same characteristics.

Some cancer medicines were discovered because Native Americans used the rosy periwinkle plant in the treatment of diabetes. When scientists studied the plant to find out whether it was effective against diabetes, they discovered that two of the plant’s ingredients kill leukemia cells. Their findings resulted in treatments for leukemia and Hodgkin’s disease.

In the mid-1990s, ethnobotanists began looking at a plant used by native healers to treat diseases caused by viruses. The native healers, or shamans, traditionally have been the ones trained to know which plants are good for healing. Ethnobotanists found that the plant used by the shamans contains a chemical called prostratin. Prostratin might stop the growth of the virus that causes acquired immune deficiency syndrome, or AIDS. Some ethnobotanists think shamans could be an important link in the process of turning plants into prescriptions.

**Multiple
Choice**

1. The author thinks ethnobotany is
 - a. not effective.
 - b. not worthwhile.
 - c. only good for curing fevers.
 - d. a valuable science.
2. What is the author’s main point in this passage?
 - a. Aspirin was developed many years ago from a salicylic acid tea.
 - b. All plants contain powerful medicines.
 - c. Important medicines have come from plants.
 - d. Ethnobotanists study the plant knowledge of native cultures.
3. What does the word *shaman* in the last paragraph mean?
 - a. a person who looks at plants used by native healers
 - b. a person trained to know which plants are good for healing
 - c. the bark and branches from the cinchona tree
 - d. the study of native healing

Activity 19 (continued)**Short
Answer**

4. What did Native Americans use powder from the cinchona tree for?
 - a. to fight diabetes
 - b. to cure malaria
 - c. to treat fevers
 - d. to treat pain

5. Describe how medicines that are used to treat leukemia and Hodgkin's disease were discovered.

6. Why do some ethnobotanists believe that shamans could be an important link in the process of turning plants into prescriptions?

Activity

20

IRA/NCTE

Standard 9

Directions: Read the passage below, then answer the questions.

Humans have the amazing ability to communicate with each other through language. Human babies can learn any one of thousands of languages. Normally, the first language they learn is the one spoken by their parents. There is good evidence that babies' brains are already programmed to learn language. For example, they are able to notice the difference between sounds at the age of one month. This has been proven with infants from families who speak different languages. In an experiment, these babies could tell the difference between sounds even if the babies' parents never used them. This means that these babies were born with the ability to tell the two sounds apart.

Babies also babble in the same language around the world. It doesn't matter whether they are Ethiopian, Japanese, or American, their early sounds are the same. Between seven and eight months of age, babies start babbling in syllables. They take the sound "ba" and turn it into "ba-ba-ba." The babbling sounds they make are common to most languages.

Children usually begin forming words by their first birthday. Most babies' first words are for objects familiar to them, such as clothes, foods, toys, animals, and people. When children reach the age of two, they use about 270 different words. By the time they are six, they use about 2,600 words.

Although much research is left to be done in the language field, it seems that learning language is a natural function of the brain. As long as a baby is exposed to a language, the baby will learn it.

**Multiple
Choice**

1. What is the main idea of this passage?
 - a. All babies make babbling sounds.
 - b. Babies around the world sound the same.
 - c. Babies are naturally able to learn a language.
 - d. Children know about 2,600 words at the age of six.
2. Which of the following statements is NOT presented as a fact in the passage?
 - a. Children know about 270 words by the age of two.
 - b. All babies can tell differences between words at one month old.
 - c. Children start forming words by their first birthday.
 - d. Babies start babbling in syllables between seven and eight months old.
3. Which of the following best describes the author's reason for writing this article?
 - a. to inform
 - b. to entertain
 - c. to persuade
 - d. to express a personal opinion

Activity 20 (continued)**Short
Answer**

4. This passage was probably written for
 - a. experts in language learning.
 - b. people learning to speak Spanish.
 - c. students studying the syllables of words.
 - d. parents interested in how babies learn language.

5. What proof does the passage give that babies are born with the ability to tell the difference between sounds at the age of one month?

6. How would you summarize this passage? Write your answer in two or three sentences.

Activity**21****IRA/NCTE****Standard 10**

Directions: Read the passage and examine the chart. Then answer the questions.

Greek and Latin root words often are used in scientific terminology. Some scientific words are the same in English as they originally were in Greek or Latin. For example, the Latin words *species*, *genera*, *spectrum*, *bacillus*, and *coccyx* are still used today in their original form. Other words use Greek or Latin prefixes or suffixes. The chart below lists some commonly used prefixes and suffixes and their meanings.

Latin or Greek prefix	Meaning
<i>a-,an-</i>	lack of, negative
<i>bi-</i>	twice, double
<i>bio-</i>	related to life
<i>bronch-</i>	windpipe
<i>chlor-</i>	green
<i>chrom-</i>	color
<i>endo-</i>	within
<i>exo-</i>	outside
<i>gravi-</i>	heavy
<i>herpe-</i>	reptile
<i>hyper-</i>	excess
<i>hypo-</i>	under
<i>intra-</i>	inside
<i>leuko-</i>	white
<i>micro-</i>	small
<i>macro-</i>	large
<i>neuro-</i>	nerve
<i>ortho-</i>	straight, upright
<i>proto-</i>	first
Latin or Greek suffix	Meaning
<i>-derma</i>	skin
<i>-ectomy</i>	to cut out
<i>-emia</i>	blood
<i>-itis</i>	disease or inflammation
<i>-logy</i>	study
<i>-osis</i>	disease

Activity 21 (continued)**Multiple
Choice**

1. What is a tonsillectomy?
 - a. a disease of the tonsils
 - b. study of the tonsils
 - c. cutting out of the tonsils
 - d. an inflammation of the tonsils
2. A disease that affects the skin is called
 - a. leukemia.
 - b. bronchitis.
 - c. dermatitis.
 - d. neuritis.
3. The study of reptiles is known as
 - a. biology.
 - b. neurology.
 - c. chromatography.
 - d. herpetology.
4. In Greek, the word *therme* means heat. If someone's body heat or temperature was too low, what word could you use to describe this condition?
 - a. thermometer
 - b. thermotropic
 - c. hyperthermia
 - d. hypothermia

**Short
Answer**

5. What is the difference between an endoskeleton and an exoskeleton? A microcyte and a macrocyte?

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6. Why do you think scientists rely on Greek and Latin words and names for classification?

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Activity

22

IRA/NCTE

Standard 10

Directions: Read the passage and examine the sample Web site. Then answer the questions.

From the Hubble Space Telescope to DNA fingerprinting, science has always been about technology. Computer technology has been a part of the world since the 1950s. The computer revolution led to the evolution of the Internet in the 1990s and now worldwide communication and information exchange is available in almost every business, school, and home in the United States. Scientists use the Internet to gather information, to showcase their work, to find sources of funding for research, and to work with other scientists. The following sample of a Web site illustrates one kind of scientific community on the Internet.

The screenshot shows a website header with navigation buttons: Home, Search, About Us, and Contact Us. A central icon depicts a refresh or exchange symbol. Below the header, a welcome message reads: "Welcome to the Scientific Xchange where you can find sources of funding, showcase your work, collaborate with colleagues, and do a whole lot more. Click on any of the links below to get started." To the right is a logo for "SCIENTIFIC XCHANGE U.S. SCIENTIFIC COMMUNITY" featuring a stylized city skyline. A list of links is provided: Discussion Forums, Funding and Grant Opportunities, Idea Xchange, Meetings and Conferences, and Science News Updates. At the bottom, a footer contains links for Find a Colleague, Marketplace Catalog, International Partnerships, and Security Statement.

Home Search About Us Contact Us

Welcome to the Scientific Xchange
where you can find sources of funding,
showcase your work, collaborate with
colleagues, and do a whole lot more.
Click on any of the links below to get
started.

- [Discussion Forums](#)
- [Funding and Grant Opportunities](#)
- [Idea Xchange](#)
- [Meetings and Conferences](#)
- [Science News Updates](#)

[Find a Colleague](#) | [Marketplace Catalog](#) | [International Partnerships](#) | [Security Statement](#)

Activity 22 (continued)**Multiple
Choice**

1. Which link on the Web site might you visit if you wanted to get a scientific research grant?
 - a. Funding and Grant Opportunities
 - b. Meetings and Conferences
 - c. Idea Xchange
 - d. Science News Updates
2. Which keyword(s) would you use to search for information on the increase in Earth's temperature due to the greenhouse effect?
 - a. geothermal energy
 - b. greenhouse plants
 - c. Earth
 - d. global warming
3. What information would you NOT find on this Web site?
 - a. meetings and conferences
 - b. career opportunities
 - c. funding and grant opportunities
 - d. discussion forums
4. Which link would you use to locate scientists outside the United States?
 - a. Find a Colleague
 - b. Security Statement
 - c. International Partnerships
 - d. Discussion Forums

**Short
Answer**

5. What can the Scientific Xchange offer on its Web site that would make it more user friendly for international scientists?
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6. Using only the Scientific Xchange Web site, how might you go about compiling a multinational list of scientists who are studying tectonic plate movement?
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Activity

23

IRA/NCTE

Standard 11

Directions: Read the passage and examine the table. Then answer the questions.

If you've ever been outside on a cold winter day, you know that the wind can make it seem much colder than what the thermometer indicates. This is because the wind is blowing away the layer of warm air that surrounds your body. Also, it is causing the moisture on your skin to evaporate. Both of these actions make you feel colder. It's similar to blowing on hot food to cool it down more quickly.

This phenomenon, called the wind chill factor, can be calculated using the wind speed and the temperature. The wind chill factor not only gives an indication of how uncomfortable outside temperatures are, it also provides a guide to help you avoid frostbite. On a calm day, bare skin can freeze in about 1 h when it is exposed to a temperature of -18°C or less and a wind speed of 16 km/h. At the same temperature with a wind speed of 64 km/h, frostbite can occur in just 10 min.

Look at the table below to see how wind speed affects temperature.

Wind Chill Index						
Temperature $^{\circ}\text{C}$	Wind speed (km/h)					
	8	16	24	32	40	48
	How it feels					
4	-3	-2	-5	-7	-9	-11
2	-0	-6	-9	-11	-13	-14
-1	-3	-9	-13	-16	-17	-19
-4	-6	-12	-17	-19	-22	-23
-7	-9	-16	-21	-23	-26	-28
-9	-12	-19	-24	-27	-30	-32
-12	-14	-23	-28	-31	-34	-36
-15	-18	-26	-32	-35	-38	-41
-18	-21	-30	-35	-39	-42	-45
-21	-23	-33	-39	-43	-46	-51
-23	-26	-37	-43	-46	-50	-53
-26	-29	-40	-46	-51	-54	-57
-29	-32	-43	-50	-55	-59	-62

Activity 23 (continued)**Multiple
Choice**

1. Which two variables does the wind chill factor take into account?
 - a. wind direction and temperature
 - b. temperature and precipitation
 - c. wind speed and temperature
 - d. precipitation and wind speed
2. If the temperature is -12°C and the wind speed is 16 km/h, what is the wind chill factor?
 - a. -23°C
 - b. -28°C
 - c. -14°C
 - d. -19°C
3. If the temperature is -1°C , what would the wind speed have to be to cause frostbite to bare skin in about 1 h?
 - a. 16 km/h
 - b. 24 km/h
 - c. 32 km/h
 - d. 40 km/h
4. When does it feel colder?
 - a. when the temperature is 4°C and the wind is blowing at 48 km/h
 - b. when the temperature is -7°C and the wind is blowing at 8 km/h
 - c. when the temperature is -1°C and the wind is blowing at 16 km/h
 - d. when the temperature is 2°C and the wind is blowing at 24 km/h

**Short
Answer**

5. Why do you think the wind chill factor table does not include wind speeds above 50 km/h?

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6. Suppose you're a member of the school ski club. What would you tell club members about today's ski trip if you discovered that the wind chill factor had reached -18°C ?

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Activity

25

IRA/NCTE

Standard 12

Directions: Read the passage below, then answer the questions.

Animals interact with each other in many different ways. Some animals partner with other animals in a relationship that is beneficial to both. One of the most interesting examples of that kind of a relationship is the one between ants and aphids.

Aphids are small insects that eat the roots, leaves, and stems of plants. They produce a sweet, sticky fluid called honeydew. Honeydew is waste material for aphids, but it is food for ants. Ants, however, do not search for honeydew left behind by aphids. Instead, they keep aphids in their nests.

Honey pot ants live in the southwestern part of the United States. They are one type of ant that keeps aphids in their nests. They “milk” the aphids by stroking them with their antennas. This causes the aphids to secrete the honeydew. Honey pot ants even have workers that store the honeydew in their bellies. The workers consume so much honeydew that they cannot move. Their purpose is to bring up honeydew from their stomachs and give it to the other ants as they need it.

Honey pot ants protect and care for the aphids. They collect food for them and care for their eggs. They protect them from predators like birds and spiders. If the aphids are in danger, the honey pot ants will move them to new nests. They even will move them to underground burrows during the winter.

The aphids also benefit from this relationship. They do not have to search for food, and they are protected from their predators. Because secreting honeydew is a natural process for aphids, they do not have to do any extra work. Living together is advantageous for ants and aphids.

**Multiple
Choice**

1. Which statement is an opinion from the passage?
 - a. One of the most interesting examples of that kind of relationship is the one between ants and aphids.
 - b. Honey pot ants even have workers that store the honeydew in their bellies.
 - c. Aphids are small insects that eat the roots, leaves, and stems of plants.
 - d. Some animals form relationships that are beneficial to both.
2. How do ants “milk” aphids?
 - a. They squeeze their bodies.
 - b. They move them from nest to nest.
 - c. They feed them stems, roots, and leaves.
 - d. They stroke them with their antennas.
3. The central idea of this passage is that
 - a. aphids use ants to find food.
 - b. ants use aphids as slaves to produce food.
 - c. ants and aphids have a mutually beneficial relationship.
 - d. ants and aphids are destructive to each other.

Activity 25 (continued)**Short
Answer**

4. Which statement below does NOT describe something discussed in this passage?
- a. Ants eat honeydew that aphids produce.
 - b. Aphids transmit viruses between plants.
 - c. Ants protect their aphids from predators.
 - d. Aphids are protected and cared for by ants.

5. Describe a relationship between a person and an animal that would be considered mutually beneficial.

6. Summarize this passage for your teacher.

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