Teacher Guide & Answers

Passage Reading Level: Lexile 1260

1. Why did geologist Edmund Hovey travel to the Caribbean in May 1902?
   A to investigate recent volcanic eruptions on the islands of St. Vincent and Martinique
   B to investigate the historic volcanic eruption of Mount Vesuvius
   C to try and predict when the next eruption of Mt. Pelée would occur
   D to try and help any survivors of the volcanic eruptions of Mt. Pelée and Mt. Soufrière

2. Towards the end of the article, the author draws comparisons between the risks of which two volcanoes?
   A Mount St. Helens and Mount Vesuvius
   B Mt. Pelée and Mt. Soufrière
   C Mt. Pelée and Mount Vesuvius
   D Mt. Soufrière and Mount St. Helens

3. Mt. Pelee and Vesuvius both had *nuée ardente* eruptions, the most explosive and deadly type of volcanic eruption. In this type of eruption, a cloud of hot ash and gas blows out of the volcano, then rushes very quickly down the volcano’s side. What conclusion can be drawn from this evidence?
   A People living near Mt. Pelée and Vesuvius should have known that these volcanoes were active and likely to erupt.
   B The *nuée ardente* type of volcanic eruption is less dangerous to humans than other types of volcanic eruptions.
   C The *nuée ardente* type of volcanic eruption is incredibly dangerous to humans living near a volcano.
   D The areas surrounding Mt. Pelée and Vesuvius are unlikely to be damaged by future *nuée ardente* eruptions.

4. Based on the text, why might predicting volcanic eruptions be an important goal of scientists studying volcanoes?
   A because knowing when volcanoes might erupt will allow scientists to help warn people to leave the area in time to save their lives
   B because knowing when volcanoes might erupt will allow scientists to gain more information about how volcanoes work
   C because knowing when volcanoes might erupt will allow scientists to better understand past eruptions
   D because knowing when volcanoes might erupt will allow scientists to collect helpful samples for museums

5. What is a main idea of this article?
   A The eruption of Mt. Pelée in 1902 was similar to the eruption of Mount Vesuvius in AD 79, and should have been better predicted.
   B The eruption of Mt. Pelée in 1902 caused massive destruction and death, partly because people at the time did not know much about volcanoes.
   C It can be very exciting to live near an active volcano, which is why people currently live near volcanoes that may erupt in the near future.
   D A geologist went to study volcanic eruptions in the Caribbean in 1902 to see how they compared to the eruption of Mount Vesuvius.
6. Read the following sentence from the text.

   “With little knowledge of how volcanic eruptions occurred, the residents of Mt. Pelée woefully underestimated the risks of living in its vicinity and ignored signals that it was still active.”

Based on this sentence, what does the word **underestimate** mean?

- A to predict correctly
- B to analyze completely
- C to take something too seriously
- D to not take something seriously enough

7. Choose the answer that best completes the sentence below.

   Thousands of people lived near Mt. Pelée in 1902 ______ the volcano’s signals that it was still active.

   - A in spite of
   - B because of
   - C as a result of
   - D resulting in

8. Describe three warning signs of the 1902 eruption in Saint-Pierre that people ignored at the time. Use details from the text to support your description.

   **Suggested answer:**
   
   Student answers should mention three of the following signs from the text:
   - Earthquakes dislodged dishes from shelves
   - Fine ash fell on a town nearby
   - A lightning-lit column of ash and fumes rose from the mountain
   - An inch of ash covered the town
   - A mudflow from the volcano killed 23 people
   - A tsunami reached the harbor
   - The mountain flung huge molten rocks in the air

9. Scientists today hope that their knowledge of volcanoes can help save human lives from future volcanic eruptions. What is one problem that might make it difficult to save lives from a future eruption?

   **Suggested answer:**
   
   Student answers may vary, but should be based in the text. Possible problems could include:
   - Dense populations around the base of an active volcano could be difficult to evacuate; for example, the article says that “the prospect of evacuating a population as dense as that around Vesuvius is daunting.”
   - Scientists cannot predict volcanic eruptions with certainty; for example, scientists disagree on when Vesuvius might erupt again.
   - Humans don't appreciate geological time scales, which makes it harder to figure out the risk of living near a volcano at any given time.
10. Can scientists’ current understanding of how volcanoes work prevent another terrible loss of human life like the ones in Pompeii and Saint-Pierre? Why or why not? Use evidence from the text to support your argument.

**Suggested answer:**

Student answers may vary, as long as they use evidence from the text to support their argument.

Those arguing that scientists’ understanding of volcanoes CAN help prevent the loss of human life may mention that people can recognize warning signs, take warning signs into account, and leave the vicinity of a volcano when scientists suggest that it might erupt. People could also choose to live away from active volcanoes.

Those arguing that scientists’ understanding of volcanoes CANNOT prevent the loss of human life may mention that scientists cannot predict volcanic activity with certainty, and that it may be difficult to evacuate large populations from areas of volcanic activity. Students may cite the speed with which Mount Pelée erupted (a flow of 300 mph, which killed 27,000 people in two minutes) as evidence that evacuations would have to happen quickly before an eruption; quick evacuation, though, would be “daunting” in areas with high populations, like Naples.
1. Which artist painted *The Life Line*?
   
   A. Edward Hopper  
   **B. Winslow Homer**  
   C. Thomas Moran  
   D. James Whistler

2. What does the first paragraph of this text describe?
   
   A. The first paragraph describes the artist's reasons for creating this painting.  
   B. The first paragraph describes how a lifesaving device works in real life.  
   **C. The first paragraph describes what is happening in the painting.**  
   D. The first paragraph describes the mysteries left in the painting by the artist.

3. Read this sentence from the text:

   "Crashing waves, dark threatening skies, and fierce winds surround the two figures in the center."

   What evidence from the painting supports the author's description of the wind as fierce, or powerful?
   
   A. The skies look dark and threatening.  
   B. The rope on the left side is slack in the water.  
   **C. The red scarf looks like it is blowing in the man's face.**  
   D. The woman's hair looks like it is soaking wet.

4. How could the weather in the painting best be described?
   
   A. hot and humid  
   **B. stormy and dangerous**  
   C. calm and rainy  
   D. bright and windy
5. What is this text mostly about?
   A. the painting *The Life Line*
   B. Winslow Homer's inspiration
   C. a heroic rescue at sea
   D. how lifesaving devices work

6. Read these sentences from the first paragraph of the text: "Crashing waves, dark threatening skies, and fierce winds surround the two figures in the center. Remnants of a sinking ship are barely visible in the upper left. Only a thin rope supports the weight of the man and woman, who are suspended above the turbulent sea."

   Why might the author have used the word "only" in the third sentence of this excerpt, when mentioning the thin rope?
   A. to emphasize that the rope was strong, even though it was thin
   B. to make the situation seem even more dangerous
   C. to suggest that most rescues like the one in the painting require one rope
   D. to imply that the scene in the painting is not realistic

7. Read these sentences from the text.

"One year before he painted *The Life Line*, American artist Winslow Homer witnessed a demonstration of a lifesaving device like the one shown in this picture. He included details that show how it worked."

   What phrase could replace the word "it" in the second sentence without changing the sentence's meaning?
   A. the artist
   B. the demonstration
   C. the picture
   D. the lifesaving device
8. According to the text, this painting depicts a suspenseful moment during what?

**Suggested answer:** The painting depicts a suspenseful moment during a heroic rescue.

9. Winslow Homer left some details of the story in the painting a mystery. For instance, he hid the man's face with the red scarf. What is another mystery that Homer left for the viewers of the painting?

**Suggested answer:** Homer also left the conclusion of the story unclear - the viewer does not know whether the rescue will be successful.

10. The text says that the painting depicts a "suspenseful" moment. What elements of the painting create the feeling of suspense? Support your answer with evidence from the text and the painting.

**Suggested answer:** Answers may vary but should be supported by the text and painting. The painting creates the feeling of suspense largely because of the moment it depicts. As the text mentions, Homer left the conclusion of this rescue story unclear. The painting also creates a sense of danger with the "crashing waves, dark threatening skies, and fierce winds." As the text mentions, "only a thin rope supports the weight of the man and woman" in the painting, which contributes to that suspense and sense of danger.
1. What do solar panels require to work properly?
   
   A. access to the sun during peak hours
   B. access to heat during the warmest part of the day
   C. access to light from the sun or the moon
   D. access to the sun only during the summer

2. What problem are households in Australia with rooftop solar panels facing?
   
   A. Many solar fences are being built to prevent different parties from accessing the sun.
   B. Many regulations are being implemented to support big construction companies in blocking the sun.
   
   C. Many high-rise buildings are being developed and blocking the households' access to the sun.

   D. Many solar panels are too big and expensive for individuals to install and maintain by themselves.
3. Please read these sentences from the text.

"Australia's rapid embrace of rooftop panels—now installed on one in four homes in some areas—has collided with another hot spot of investment, construction of apartments and homes. With many new high-rise buildings casting shade for much of the day, more households want the courts to intervene to prevent potential blockages.

'There needs to be rules, some process in place over how to deal with this," said Jenny Port, a gallery owner who has waged a seven-month battle to block construction of a 16-story apartment tower beside her inner city art space and home in Melbourne. "Right now there's just nothing, no rights at all to the sun.'"

What conclusion can be drawn about the issue of 'rights to the sun' in Australia based on these sentences?

A. It has been an important issue in Australia for a very long time, but no one has understood it fully till recently.
B. It is a relatively new issue in Australia, and people have not properly addressed it yet.
C. It is a bigger issue for developers of high-rise buildings than it is for households with solar panels.
D. It is a bigger issue in Australia than it is in other places in the world.

4. Based on the text, who is most likely to be against laws or regulations in Australia that protect people's access to the sun?

A. building developers and construction workers
B. lawmakers and the court system
C. residents of the sunniest parts of Australia
D. residents of countries other than Australia
5. What is the main idea of this text?

A. In Australia, a group of residents have banded together in a court challenge to block a four-story apartment complex from being built by their homes.

B. In Australia, there is an ongoing struggle between households and building developers over the households' right to access the sun for solar power.

C. Lawmakers in Australia are open to creating guidance and regulations to help protect people's solar access and boost their usage of renewable energy.

D. While it is possible to create regulations to protect solar access, they often come with red tape and complications that lead to more disputes.
1. What instrument does Lina play?
   A. the saxophone
   B. the trumpet
   **C. the piano**
   D. the drums

2. Throughout the story, Lina asks her parents lots of questions about jazz music. What motivates Lina's questions?
   A. **Lina wants to learn something new.**
   B. Lina is preparing for a music history test.
   C. Lina's homework is to interview her parents.
   D. Lina needs help with her piano homework.

3. Lina is anxious to learn a different type of music. What evidence from the passage best supports this conclusion?
   A. "Old and crinkled sheet music sat in front of her, the black notes blankly staring at her. She stared at them for so long, her vision started to blur."
   B. "She loved the piano; she always had, ever since she started playing at the age of six. But something was beginning to bother her."
   C. "Lina had been working on this piece for the past week, trying to master the tricky rhythm and memorize the movements required by her long fingers."
   **D. "They were all classical music pieces, and even though Lina loved them, she was itching to try something new."**

4. What conclusion can be made about Lina's family and their relationship to jazz?
   A. Lina is the first person in her family to be interested in jazz.
   **B. Jazz has been important to many people in Lina's family.**
   C. Lina's family used to like jazz, but now they think it is too popular.
   D. Lina is the only person in her family who doesn't like jazz.
5. What is this story mostly about?

A. Lina learns about jazz and her family's ties to the music.
B. Lina is tired of playing the piano and wants to learn something new.
C. Lina learns how to play jazz piano and improvise new melodies.
D. Lina discovers that both of her parents enjoy jazz music.

6. Read the following sentences: "Lina thought about improvising. She could hardly imagine just sitting down at the piano and playing anything that came to her mind, just piecing together notes in a way that would captivate her listeners. She remained silent for a while, concentrating hard on what she could possibly play off the top of her head."

As used in this sentence, what does the word "improvising" most nearly mean?

A. performing from sheet music
B. making something better
C. inventing new music while performing
D. playing music for an audience

7. Choose the answer that best completes the sentence below.

__________, swing music was played in African-American communities before it became popular in ballrooms across America.

A. However
B. Finally
C. Obviously
D. Initially

8. What is swing music?

Swing music is a type of jazz style with a strong beat that really makes you want to dance.
9. Where did swing music originally come from?

Swing music originally came from the African-American community.

10. How was music passed down through generations in Lina's family? Use information from the passage to support your answer.

Students should summarize the connections with jazz music in Lina's lineage. Her maternal grandfather and great-grandfather both played swing music. Lina's mother explains that Lina's great-grandfather taught her grandfather how to play the piano. Her mother also describes how Lina's grandfather was a huge fan of jazz music and how Lina's mother herself listened to jazz while growing up. Lina's father is also a huge fan of jazz music, introducing her to the Duke Ellington song, "Things Ain't What They Used to Be." This song inspires Lina to play jazz music. Thus, the love of jazz music and the talent to play it were passed down through different generations in Lina's family.
Passage Reading Level: Lexile 1210

1. C  the ability to see

2. A  Darwin's understanding of evolution and his explanation of blindness in cave fishes

3. C  "...if you have an accident and lose a finger, your children will still be born with five fingers on each hand. If you lift weights and become a body builder, it doesn't mean your children will be born with bulging biceps. In each case, your genes haven't changed—even though your body has."

4. C  The trait of blindness has a neutral effect; it is neither an advantage nor a disadvantage.

5. D  Many cave fishes are blind, and an experiment carried out by scientists suggests that blindness in these fishes is the result of a mutation that also improves their sense of smell.

6. B  to prepare readers for a discussion of possible answers to this question in the article

7. C  However

8. Suggested answer: Answers may vary but should reflect the text. The first hypothesis is that blindness gives the tetra some sort of evolutionary advantage. That advantage might be the result of pleiotropy, which is when multiple effects are caused by the same mutation in one gene. Scientists think that the mutation that causes blindness in the tetra might also cause a "seemingly unrelated change in the fish that is beneficial."

9. Suggested answer: Another effect it might have is to improve cave tetras' sense of smell.

10. Suggested answer: Answers may vary but should resemble the following. Scientists' first hypothesis was that blindness gives the tetras some sort of evolutionary advantage. They thought the advantage might be the result of pleiotropy, which is when multiple effects are caused by the same mutation in one gene. The experiment led scientists to discover a gene that seems to have multiple effects. It causes blindness in cave tetras and may also improve their sense of smell. An improved sense of smell would be an evolutionary advantage for a fish that lives in the dark. In this way, blindness seems to be linked to an evolutionary advantage in cave tetras. The link supports the first hypothesis scientists have about blindness in the tetras.
1. What is a zebra mussel?
   A  a small striped fish found in rivers and lakes
   B  a small animal with two shells that lives in water
   C  a large animal with one shell that lives in water
   D  a large plant with striped leaves that lives in water

2. How can zebra mussels cause native mussels and other shelled animals to die?
   A  The zebra mussels feed on the native mussels and other shelled animals.
   B  The zebra mussels rest on top of native mussels and shelled animals and crush them.
   C  The zebra mussels force native mussels and shelled animals to move out of the habitat.
   D  The zebra mussels cling to native mussels and shelled animals and prevent them from eating.

3. Scientists predicted that the zebra mussel would arrive in the Hudson River. What evidence supported their prediction?
   A  Zebra mussels cling to hard surfaces, forming colonies that are almost impossible to remove.
   B  Zebra mussels came to the Great Lakes from the freshwater lakes of Europe and Asia.
   C  Zebra mussels are able to survive in cold and warm water, and the Hudson River has both.
   D  Zebra mussels were in the Great Lakes, and waterways connect the Great Lakes to the Hudson River.

4. The scientists wondered how zebra mussels might impact the Hudson River ecosystem. What is one example of information that might help them understand the zebra mussels’ impact?
   A  the amount of plankton in the river before and after zebra mussels arrive
   B  the number of boats traveling on the river before and after zebra mussels arrive
   C  the amount of time it takes for zebra mussels to travel to the Hudson River
   D  the strength of the tides that come from the Atlantic Ocean after zebra mussels arrive

5. What is the main idea of this article?
   A  Zebra mussels are the most dangerous invasive species because of the effects they can have on humans.
   B  Zebra mussels are an invasive species that can affect food webs and new habitats, and were expected to arrive in the Hudson River.
   C  Zebra mussels can upset food webs by clinging to shelled animals and removing food from large bodies of water.
   D  Scientists started monitoring the Hudson River’s ecosystem in 1986, even though the river had no zebra mussels at the time.
6. Read the following sentence from the text.

“The zebra mussel is an invasive species, a species that’s brought from its native area to a new place where it thrives and causes changes in the local habitats and communities.”

What does the phrase “native area” mean in this sentence?

A the food source of a species
B the animals or plants related to a species
C the new habitat to which a species moves
D the place where a species is naturally found

7. Choose the answer that best completes the sentence.

Zebra mussels can affect humans and cause millions of dollars in damage. _____, the mussels clog water pipes to businesses and power plants.

A For example
B Consequently
C However
D Therefore

8. What do zebra mussels feed on?

Suggested answer: Zebra mussels feed on plankton.

9. The Hudson River has murky water, which means that only a little sunlight can pass through. How does this affect the things that live in the river?

Suggested answer: Answers may vary slightly. All answers should recognize that, because there is not much sunlight, fewer plants and phytoplankton can live in the river. Students may infer that because there are fewer plants and phytoplankton, there may be fewer animals that feed on these producers.

10. How might the number of fish in the Hudson River be impacted by the arrival of zebra mussels? Use evidence from the text to support your answer.

Suggested answer: Answers may vary in depth, as long as they are supported with evidence from the text. Students should recognize that the number of fish might decrease due to the arrival of zebra mussels because of zebra mussels’ impact on the food web. Since zebra mussels eat plankton, and there is a limited amount of plankton in the Hudson River, zebra mussels are likely to consume most of the plankton in the ecosystem. This will result in less available food for the fish who eat plankton, which will likely lead to a decrease in number.
Teacher Guide & Answers

Passage Reading Level: Lexile 1000

1. How many zebra mussels were there in the Hudson River within a year of their first appearance?
   A  500 billion
   B  500 million
   C  500 thousand
   D  500

2. This text explains a cause-and-effect pattern in the Hudson River ecosystem that began with the zebra mussel invasion. What effect did the zebra mussels have on the phytoplankton in the Hudson River?
   A  The number of phytoplankton in the river rose by a little.
   B  The number of phytoplankton in the river fell by a little.
   C  The number of phytoplankton in the river rose by a lot.
   D  The number of phytoplankton in the river fell by a lot.

3. Phytoplankton are one of the most important parts of the food web in the Hudson River. What evidence supports this conclusion?
   A  The population of phytoplankton dropped sharply soon after zebra mussels invaded the river.
   B  The decrease in phytoplankton caused a decrease in the river’s zooplankton, fish, and native mussel populations.
   C  The decrease in phytoplankton meant that the river’s turbidity, or cloudiness, decreased.
   D  Zebra mussels caused oxygen levels in the river to drop, partly by removing the phytoplankton that produce oxygen.

4. Which population was helped by the invasion of the zebra mussels?
   A  phytoplankton
   B  zooplankton
   C  water celery
   D  native mussels

5. What is the main idea of this text?
   A  In the years right after the invasion, zebra mussels evolved and adapted to the Hudson River ecosystem.
   B  In the years right after the invasion, zebra mussels caused a number of changes in the Hudson River ecosystem and food web.
   C  In the years right after the invasion, zebra mussels did not have a major impact on the Hudson River ecosystem or food web.
   D  At first, zebra mussels did not have any impact on the Hudson River ecosystem, but their impact increased over time.
6. Read these sentences from the text.

“In the years right after the invasion, phytoplankton fell by 80 percent. Zooplankton (which eat phytoplankton) declined by half. And the smallest zooplankton (called micro-zooplankton), fell by about 90 percent.”

Based on these sentences, what does the word “decline” most nearly mean?

A to drop in number  
B to fall over  
C to increase  
D to stay the same

7. Choose the answer that best completes the sentence.

With far less phytoplankton, the water got clearer. ______, rooted aquatic plants such as water celery increased by up to 40 percent.

A In contrast  
B However  
C As a result  
D Similarly

8. What are two populations that decreased as an immediate result of the zebra mussel invasion?

Suggested answer: Answers may vary but should include two of the following: phytoplankton, zooplankton, micro-zooplankton, (certain types of) fish, and native mussels.

9. One direct effect of the zebra mussel invasion was a decrease in the cloudiness of the water. How did this affect species in the Hudson River ecosystem?

Suggested answer: The decrease in the water’s cloudiness allowed sunlight to reach deeper into the water, which allowed more rooted aquatic plants like water celery to grow. This also caused an increase in the population of fish that live in those plants.

10. Once scientists understood the short-term impact of the zebra mussel invasion, they started to wonder about the invasion’s long-term impact on the ecosystem. Why might the Hudson River ecosystem look different many years after the zebra mussel invasion than it did just a few years after the invasion? Use evidence from the text to support your answer.

Suggested answer: Answers may vary, but should recognize that each change triggered by the invasion will cause another change in the ecosystem. This cause-and-effect chain can be seen in the way zebra mussels indirectly caused the growth of the water celery population by eating plankton. This larger water celery population could trigger new changes in the ecosystem, resulting in an ecosystem that looks very different in the long-term than it did in the short-term. The text also indicates that zebra mussels could evolve in their new ecosystem, or that other species could evolve or arrive; any of these changes would likely affect the other factors in the ecosystem, as well. As such, the ecosystem is likely to look different many years after the invasion than it did just a few years after the invasion.
Human Microbiome: The Role of Microbes in Human Health

by American Museum of Natural History
This article is provided courtesy of the American Museum of Natural History.

You Are an Ecosystem

An ecosystem is a community of living things that interact with each other and with the non-living things in their physical environment. Forests, lakes, and caves are ecosystems. Each contains a unique mix of living components, like plants and animals, and non-living ones, like air, sunlight, rocks, and water. The human body is also an ecosystem. We are home to thousands of kinds of bacteria, viruses, fungi, and other microscopic organisms, which number in the trillions. These organisms are called microbes. Together they form communities that make up the human microbiome. Like fingerprints, no two human microbiomes are the same. That makes each person not just an ecosystem, but a unique ecosystem.

Microbes first appeared over 3.5 billion years ago, making them the oldest form of life on Earth. Over the past six million years, humans and microbes have coevolved to form complex relationships. Humans need a microbiome to stay healthy, and the microbiome needs environments provided by the human body in order to survive.

Just like larger organisms, the species that make up a microbiome interact with each other and rely on these interactions to thrive. Different species live in different places in and on our bodies, and are adapted to these environmental conditions.

Scientists are studying how these microorganisms work in our bodies, and learning about the balance among different bacterial communities. Products like antibacterial hand sanitizers can wipe out all bacteria on a patch of skin, good and bad alike. Antibiotic drugs also destroy helpful bacteria along
Human Microbiome: The Role of Microbes in Human Health

with their targets. Fungi evolved the ability to produce anti-bacterial chemicals as they competed with bacteria over millions of years of evolution. By studying these fungi, scientists learned how to manufacture these anti-bacterial chemicals and turn them into antibiotic drugs, which have saved millions of lives. At the same time, studies suggest that rapidly increasing antibiotic use in the United States has reduced the diversity of our microbiomes.

Supporting Players

Do the bacteria in your body act as friend or foe? As pathogen or protector? It depends.

Thousands of species of bacteria inhabit our bodies, and researchers are only beginning to understand the complex interrelationships among them-and between microbial cells and human ones. We know that some are pathogens and cause disease. Scientists are increasingly finding that the majority of bacteria are not harmful. Rather, many benefit us in a variety of ways, from aiding digestion to protecting our teeth.

Scientists are just beginning to understand what roles these organisms play in human health. It's a complicated dynamic and the effects on human health depend on the population size of the microorganisms and on conditions in their ecosystem, the human body. The key? Balance. Here are some of the species that play an important part in maintaining a healthy equilibrium-bacteria that, you might say, have your back.

Skin Deep

Perhaps not surprisingly, skin-our interface with the world-supports a large number of the body's most diverse populations of bacteria. There are at least 1,000 different species of skin bacteria, along with dozens of fungi and other microbes. Most aren't harmful, and many protect us. They live among the dead skin cells that make up our skin's outer layer, and defend their own turf against other microbes. One strain of the bacterium *Bacillus subtilis*, which can be found on the skin, produces bacitracin, a toxin that helps it fight off other microbes. Scientists have taken advantage of bacitracin's antibiotic properties, using it in over-the-counter antibiotic ointments.

Gut Feeling
1. What is the human microbiome?
   
   **A. all of the communities of microbes in and on the human body**
   
   B. a drug that destroys helpful bacteria along with harmful bacteria
   
   C. a species of bacteria that helps protect humans against asthma
   
   D. a group of people in developed countries who are infected with Helicobacter pylori

2. To organize this text, the author divides it into sections with subheadings. What contrast does the author make in the section with the subheading "Look, Ma, No Cavities!"?

   **A. The author contrasts the harmful effects of Helicobacter pylori with the positive role it may play in human health.**
   
   **B. The author contrasts the number of bacteria on our skin with the number of bacteria in our colon.**
   
   **C. The author contrasts harmful species of Streptococcus with a species of Streptococcus that can be helpful.**
   
   **D. The author contrasts the effects of Bacteroides inside the colon with the effects of Bacteroides outside the colon.**

3. Some species of bacteria benefit humans.

What information in the text supports this statement?

   **A. *S. mutans* is a bacterium that causes cavities, and *S. pneumonia* is a bacterium that causes pneumonia.**
   
   **B. Fungi evolved the ability to produce anti-bacterial chemicals as they competed with bacteria over millions of years.**
   
   **C. The bacterium *Streptococcus pyogenes* causes strep throat and rheumatic heart disease.**
   
   **D. Species of bacteria belonging to the genus Bacteroides help the human body digest food.**
4. Bacteria that are helpful in one place may be harmful in another.

What information in the text supports this statement?

A. *Heliobacter pylori* is a bacterium that causes gastritis (irritation or inflammation of the stomach lining) and peptic ulcers, diseases which were once thought to be caused by too much acid.

B. *Streptococcus salivarius* appears to help prevent tooth decay in the mouth but can be dangerous to people with weakened immune systems if it gets outside the mouth.

C. *Bacillus subtilis* releases toxic chemicals to kill fungus, possibly including *Trichophyton interdigitale* and other species that cause athlete's foot.

D. Skin, which is our interface with the world, supports a large number of the human body's most diverse populations of bacteria, including *Bacillus subtilis*.

5. What is the main idea of this text?

A. Microbes first appeared over 3.5 billion years ago and have coevolved with humans over the past six million years.

B. Studies suggest that rapidly increasing antibiotic use in the United States has reduced the diversity of our microbiomes.

C. *Bacteroides* are the most numerous bacteria in the human body and help it digest food.

D. The human body is an ecosystem made up of microbes that play a variety of roles in human health.
6. Read these sentences from the text.

"Perhaps not surprisingly, skin-our interface with the world-supports a large number of the body's most diverse populations of bacteria. There are at least 1,000 different species of skin bacteria, along with dozens of fungi and other microbes. Most aren't harmful, and many protect us."

Based on this information, what does the word "diverse" probably mean?

A. having a lot of variety  
B. being harmful to others  
C. being helpful to others  
D. moving from one place to another

7. Read this sentence from the text.

"In fact, the microbiome is so important that it is like an additional organ-a part of the body that serves a vital function, like the skin or kidneys."

What word or phrase could replace the second "like" in this sentence without changing the sentence's meaning?

A. instead  
B. such as  
C. except  
D. later on

8. What is a species of bacteria that causes disease?

Suggested answer: Answers may vary as long as they reflect the text. For example, students may name Streptococcus pyogenes.
9. What is a species of bacteria in your body that helps protect you? Support your answer with evidence from the text.

**Suggested answer:** Answers may vary as long as they reflect the text. For example, students may identify Heliobacter pylori as a species of bacteria that helps protect people. Studies suggest that it helps prevent "asthma, allergies, gastroesophageal reflux disease, and esophageal cancer."

10. Describe the different roles that bacteria play in human health. Support your answer with evidence from the text.

**Suggested answer:** Answers may vary, but students should recognize that bacteria plays positive and negative roles. Students may point out that some bacteria, such as Heliobacter pylori and Streptococcus salivarius, play helpful roles by protecting people from various diseases. Other bacteria play harmful roles. One example is Streptococcus pyogenes, which causes strep throat and rheumatic heart disease.