• Reading Comprehension Assessment

Directions: Read the passage. Then answer the questions below.

Early Bicycles: Trials & Errors

In the nineteenth century, bicycles were an exciting new mode of transportation. But the first bicycles were not as comfortable, efficient, or safe as bicycles are today. Because the first bicycles did not function perfectly, they were redesigned frequently. Although those trials and errors happened two centuries ago, they made our current bicycles possible.

In the 1860s, an imperfect bicycle called the velocipede became popular. Because it shook riders excessively, people called it the “boneshaker.” Made of wood and iron, it was stiff and heavy. The boneshaker’s massive frame and sturdy wheels helped the bicycle to withstand the rough cobblestone roads. But they could not protect its rider from the road’s unpleasant bumps. The seat helped some because it was attached to a spring. But the handlebar still shook a lot. Moreover, the boneshaker did not move efficiently. The front wheel had inflexible wooden spokes attached in straight lines from the hub to the rim. Those radial spokes did not convey the force from the pedals very efficiently.

The next popular bicycle—called the high bicycle, ordinary, or penny farthing—was more efficient. The high bicycle had a huge front wheel and a tiny back wheel. People sat directly above the tall front wheel and moved the pedals attached to it. Each time the rider pushed the pedals in a small circle, the giant wheel moved in a large circle. One small pedal cycle moved the bicycle forward very far and very fast!

The innovations in the high bicycle’s front wheel made its speed and ease of movement possible. First, the high bicycle’s front wheel was bigger than the boneshaker’s, so it could move farther. Second, its spokes were made of thin metal rods, so they were lighter and more flexible than the boneshaker’s heavy wooden spokes. Reducing the wheel’s mass made the wheel easier to push. Third, the high bicycle’s spokes were placed at angles (tangentially) between the hub and rim, instead of in straight lines (radially) as in the boneshaker. The tangential spokes conveyed the pedals’ force more effectively, making the wheel more efficient and more powerful. Finally, the high bicycle had solid rubber tires. They were more soothing than the boneshaker’s iron ones.

Unfortunately, the high bicycle was very dangerous. Although the small back wheel provided some stability, people still fell from the tall bicycles. And when that happened, they got hurt very badly! Because they were sitting high off of the ground, they had a long way to fall. And nineteenth-century bicycle riders did not wear helmets, so serious injuries were common.

Not surprisingly, the next bicycle—called the safety bicycle—privileged safety over efficiency and comfort. Its wheels of equal and moderate size allowed people to touch the ground with their feet. So when people fell, they didn’t fall far. But the safety bicycle was harder to operate than the high bicycle.

Most modern bicycles today are based on the safety bicycle of the 1880s. Over time, designers have improved the bicycle to keep its safety features while increasing its efficiency and comfort.
1) According to the passage, bicycles were invented in the
   A. 1700s
   B. 1800s
   C. 1900s
   D. 2000s

2) All of the following bicycle parts made boneshakers uncomfortable to ride EXCEPT
   A. the wheels
   B. the handlebar
   C. the seat
   D. the frame

3) As used in paragraph 4, the word **innovations** means all of the following EXCEPT
   A. enlargements
   B. changes
   C. alterations
   D. modifications

4) The main purpose of paragraph 5 is to
   A. make us feel sorry for people who got hurt
   B. argue that high bicycles should not have been sold
   C. illustrate the need for helmets
   D. explain how high bicycles were imperfect

5) Using the information in the passage, we can tell that the best bicycle design would
   A. balance comfort, efficiency, and safety, even if the bicycle became a little worse in each area
   B. prioritize comfort, even if it lowered the bicycle’s efficiency and safety
   C. offer comfort and efficiency, even if it made the bicycle less safe
   D. ensure that the bicycle was safe, even if it was less efficient or comfortable

6) Based on the information in the passage, explain in your own words the main differences between the boneshaker and the high bicycle.

________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
7) If you had the opportunity to ride a high bicycle instead of a modern bicycle, would you do it? Why or why not?

8) This passage focuses on how one mode of transportation evolved over time. What do you know about how other modes of transportation (cars, trains, planes, etc.) have changed over time? Were the changes similar to the changes in the development of the bicycle? How?
1) B
Question Type: Detail
We can find the answer to this detail question in the first sentence of the passage. Paragraph 1 says, “Bicycles were invented in the nineteenth century.” But there are other clues as well. In paragraph 1 says: “Although those trials and errors happened two centuries ago, they made our current bicycles possible.” That sentence gives us a hint to count back two centuries from today. Since we are in the 2000s (the twenty-first century), two centuries earlier would be the 1800s (the nineteenth century). Finally, the other two dates in the passage, the “1860s” (from paragraph 2) and “1880s” (from the last paragraph), give us more evidence that bicycles were invented in the 1800s. With this information, we know that (B) is correct. The passage does not provide support for choice (A). Therefore, it is incorrect. We might associate the nineteenth century with the 1900s because nineteen/19 appears (in one form or fashion) in both. But the clues in the passage point to the 1800s. They help us to eliminate (C). The passage does not provide support for choice (D). Therefore, it is incorrect.

2) C
Question Type: Detail
To answer this detail question correctly, we need to find where the passage talks about boneshakers. A good way to start is to skim the first sentence of every paragraph, since the topic sentence introduces the main idea(s) of the paragraph. Paragraph 2 says, “In the 1860s, an important bicycle called the velocipede became popular.” That sentence does not use the word boneshaker, but it mentions “an imperfect bicycle,” so we get a sense that the information we need may be in paragraph 2. Since the next sentence tells us that “boneshaker” was its nickname, we know to keep reading. When we do, we find the information we need: the bicycle part that made riding a boneshaker more comfortable. We read: “The seat helped some because it was attached to a spring.” That sentence helps us understand that (C) is correct. Paragraph 2 tells us that the boneshaker’s “sturdy wheels” “could not protect its rider from the road’s unpleasant bumps.” Using that information, we can eliminate (A). Paragraph 2 also tells us that the boneshaker’s handlebar “shook a lot.” Since holding a shaking handlebar would be uncomfortable, we can eliminate (B) as well. Paragraph 2 also says that the boneshaker’s “massive frame” “could not protect its rider from the road’s unpleasant bumps.” Therefore, (D) is also incorrect.

3) A
Question Type: Vocabulary
innovation (noun): the action or process of innovating; a new method, idea, product.

If we substituted the word enlargements for the word innovations, then topic sentence of paragraph 4 would change. In the passage, it says “And now innovations in the high bicycle’s front wheel made it possible.” If we replaced the word innovations with enlargements, then the sentence would only refer to the larger size of the high bicycle’s wheel. That would be a significant change. As a topic sentence, the sentence is supposed to introduce the main idea: that the high bicycle’s wheel differed from the boneshaker’s wheel in many ways. Since the wheel’s enlargement is a specific innovation, it is not a good synonym for innovations in general. Choice (A) is the exception, so it is correct. We could substitute the word changes for the word innovations without changing the essential meaning and function of paragraph 4’s topic sentence. Since we are looking for the word that does not substitute well, we can eliminate (B). We could also substitute the word alterations for the word innovations without changing the essential meaning and function of paragraph 4’s topic sentence. That helps us to eliminate (C) as well. Finally, we could substitute the word modifications for the word innovations without changing the essential meaning and function of paragraph 4’s topic sentence. Because (D) is not an exception, it is incorrect.

4) D
Question Type: Inference
From the title and the introduction (paragraph 1), we can tell that the passage will be about the “trials and errors” of early bicycle designs. Because every body paragraph must relate to the passage’s main idea, paragraph 5 must also be about a trial or error. Because paragraph 5 is about how dangerous high bicycles were, we can tell that the paragraph is about an error in the bicycle’s design. Having introduced an error, the passage then goes on to introduce the trial of a new design (that was more successful). If the high bicycle had been perfect, then the next model (and the passage’s last paragraph) would have been unnecessary. Because the author uses paragraph 5 to explain how high bicycles were imperfect, (D) is correct. Reading paragraph 5, we may feel sorry for the people who got hurt when riding high bicycles. We may even enjoy the paragraph’s dramatic language and punctuation. But the passage is not intended to entertain us or make us feel a certain way. The primary purpose is to inform us of the trial and errors in early bicycle designs. And paragraph 5, in particular, explains one of those errors. Therefore, (A) is incorrect. Because high bicycles were dangerous, some people might argue that they should not have been sold. But the author does not make that argument. The passage does not provide support for (B). Therefore, it is incorrect. Paragraph 5 mentions the downside of people not wearing helmets. It says, “And nineteenth-century bicycle riders did not wear helmets, so serious injuries were common.” But that is the only time that helmets are mentioned. Since the need for helmets was not the main purpose of paragraph 5, we can eliminate (C).

5) A
Question Type: Global
Paragraph 1 mentions comfort, efficiency, and safety, so we know that those features are important. They also become the standard by which each bicycle is judged. The rest of the passage describes each bicycle’s strengths and weaknesses in those areas. It also suggests that each bicycle was replaced or improved because it failed in one or more of those areas. That leads us to conclude that (A) is correct. Paragraph 2 on the boneshaker could lead us to believe that comfort matters most of all. But subsequent paragraphs suggest that other bicycles were better because they also considered efficiency and safety. That helps us to eliminate (B). The description of the high bicycle in paragraphs 3-5 could lead us to think that comfort and efficiency matter more than safety. However, according to paragraphs 5 and 6, the safety bicycle came after the high bicycle. And modern bicycles are based on the safety bicycle. So safety must be important, too. Using that information, we can eliminate (C). Paragraphs 5 and 6 discuss safety. According to paragraph 5, the high bicycle was imperfect because it was unsafe. From paragraph 6, we can tell that the safety bicycle met people’s desires for a safe mode of transportation. Because modern bicycles are based on the safety bicycle, we might be tempted to think that safety matters most. But the passage spends a lot of time talking about comfort and efficiency. It
also suggests that modern bicycles kept the “safety features” while improved the safety bicycle’s “efficiency and comfort.” Because efficiency and comfort are as important as safety, (D) is incorrect.