Teacher Guide & Answers

Passage Reading Level: Lexile 1240

1. Why is the Huronian Supergroup rock formation particularly interesting to scientists?

- **A** because it looks like a cross-section of a giant, stone encyclopedia
- **B** **because it formed during the period when oxygen began to accumulate in the atmosphere**
- **C** because it contains unusually large amounts of oxygen and sulfur
- **D** because it dramatically altered the planet's development when it first formed

2. In this article the author explains what scientists are trying to find out. What are the scientists in the article trying to find out?

- **A** how the proportions of different sulfur isotopes change in the geologic record
- **B** how the ozone layer formed and the effects of its formation
- **C** **when oxygen increased in Earth's early atmosphere**
- **D** when sulfur first appeared in Earth's early atmosphere

3. Read these sentences from the article.

"I've often wished that I had a time machine to go back and collect a sample of ancient atmosphere or an ancient bit of seawater," says [Jay] Kaufman. "But we can't. All we can do is collect rocks that were formed under those waters and under that atmosphere."

Which conclusion does this statement support?

- **A** Scientists are skeptical about their ability to determine when oxygen levels in the Earth's early atmosphere rose.
- **B** Scientists are unable to study what the Earth was like millions of years ago because they do not have the materials needed to do so.
- **C** Scientists study the atmosphere in order to learn what the Earth's seawater was like millions of years ago.
- **D** **Scientists study rock formations in order to learn what Earth's atmosphere was like millions of years ago.**

4. Read these sentences from the article.

"Individual layers of ancient sediment form horizontal stripes on the rock. From a few steps back, the rock wall looks like a cross-section of a giant, stone encyclopedia."

Why might the author have included this description of the rock wall?

- **A** to explain why the author quotes scientists in the article
- **B** to show why the author presents information about different compounds in the article
- **C** to demonstrate why the author explains two different methods used to date the rise of oxygen in the atmosphere
- **D** **to clarify why the author compares studying a rock formation to studying a book**

5. What is the main idea of this article?

- **A** Scientists learn about sulfur by studying ancient rocks.
- **B** Scientists learn about redbeds by studying the history of Earth's atmosphere.
- **C** **Scientists learn about the history of oxygen in Earth's atmosphere by studying rocks.**
- **D** Scientists learn about the history of sulfur in Earth's atmosphere by studying oxygen.

6. The author asks these questions in the article.

"But what can rocks reveal about something as formless as air, much less air that existed billions of years ago? How does one study the ancient atmosphere when no samples of it are left to collect?"

Why might the author ask these questions? Consider both the questions themselves and their context in the article.

A to get the reader thinking about something that will be explained later in the text
B to force the reader to come up with ways to study the ancient atmosphere without collecting samples
C to invite the reader to learn more about the questions scientists ask themselves
D to suggest to the reader that it's impossible to learn about the ancient atmosphere using today's rocks

7. Look at the underlined word in this sentence from the article.

"As exposed rock weathers, its composition is altered by compounds in the air."

Which of the following words could replace "its" without changing the meaning of the sentence?

A the rock's
B the weather's
C the Earth's
D the compounds'

8. In order to determine when oxygen levels increased in the Earth's atmosphere, which element did James Farquhar and his team search for in rocks?

Suggested answer: Farquhar and his team searched for traces of sulfur in rocks.

9. Jay Kaufman said that while scientists cannot collect and study samples of the ancient atmosphere, they can "collect rocks that were formed… under that atmosphere." Why are scientists able to learn about the ancient atmosphere by studying the rocks that came into contact with the ancient atmosphere?

Suggested answer:
The atmosphere interacts with rocks on the Earth's surface. Scientists are able to learn about the ancient atmosphere by studying those rocks today. The article states that as exposed rock weathers, its composition is altered by compounds in the air. Scientists can study these clues to learn details about the atmosphere that caused the alteration.

10. Explain what scientists might be able to learn about the seawater that existed millions of years ago by studying rocks that came into contact with seawater at that time in the past. Use evidence from the text to support your inference.

Suggested answer: Student answers may vary. For example, students may reason that since scientists were able to study rock formations to determine when oxygen levels increased in the Earth's early atmosphere, they may also be able to study rocks that came into contact with ancient seawater to determine the oxygen levels within that seawater. They may also be able to study the different compounds that were present in that water by studying the geologic record of rocks that came into contact with ancient seawater. Students may support this inference by pointing out that scientists were able to study sulfur isotopes and their proportions in the geologic record above water.