

Big News About Old Rocks

Grand Old Canyon

Rocks reveal new clues to a complicated history.

Some small rocks from Arizona's Grand Canyon recently led scientists to a big discovery. The canyon is not just huge, it is also amazingly old. "The traditional view was that the canyon formed 6 million years ago," said Rebecca Flowers, a scientist at the University of Colorado. Her research, though, shows that the Grand Canyon could be 10 times older.

The canyon is called "grand" because it is so large. It is 277 miles long, up to 18 miles wide, and more than a mile deep. Since ancient times, the canyon has astonished millions of visitors—including plenty of **geologists**. Geologists are scientists who study Earth's history by examining rocks, soil, and other parts of the planet.

For decades, geologists thought they knew how and when the canyon formed. Many believed the canyon began to develop 6 million years ago when Earth's **crust**, or rocky outer layer, pushed upward. As the crust rose, the Colorado River dug the canyon deeper and deeper through the process of **erosion**. Erosion is the wearing away of Earth's surface by water, wind, or ice.

Deep History

Flowers and other scientists used new methods to examine the chemicals in the canyon's rocks to calculate the age of the rocks. According to their research, parts of the canyon formed at least 55 million years ago. They also found evidence that the Grand Canyon started out as several smaller, separate canyons.

"Different [parts] of the canyon evolved at different times," Flowers told *ScienceSpin*. Flowers thinks that the Colorado River probably did cut through Earth's crust 6 million years ago, but other sections of the canyon formed long before that time. Then the river carved a path between the oldest parts. The smaller gorges joined to become one truly grand canyon.

The new findings fit with other recent research that hints that the canyon is older than once thought. Many questions about the Grand Canyon's history still remain. Scientists are coming up with new ways to study the chemicals

in rocks, though, and discovering new answers. Most scientists agree on one thing, says Flowers,: "The Grand Canyon does have a complicated history."

Name: _____ Date: _____

1. Which of the following statements about the Grand Canyon is NOT true?

- A The canyon is very old.
- B The canyon is small.
- C The canyon is well-known.
- D The canyon has rocks.

2. Rebecca Flowers and other scientists used new methods to examine the canyon's rocks. What was the effect of their work?

- A They discovered that the canyon was larger than people thought.
- B They learned that the canyon may be older than once thought.
- C They found a new part of the canyon that was hidden from view.
- D They found evidence that the Colorado River cut through Earth's crust.

3. What can you conclude after reading the passage?

- A The Grand Canyon will now receive fewer visitors.
- B Most geologists will lose interest in the Grand Canyon.
- C Scientists don't all agree on when the canyon formed.
- D Most scientists agree that the canyon isn't worth studying.

4. Read this sentence from the passage: "Different [parts] of the canyon evolved at different times," Flowers told ScienceSpin.

Based on the text, the word **evolved** most nearly means

- A developed
- B disappeared
- C twisted
- D advanced

5. Which statement best describes the central idea of this passage?

- A The Grand Canyon formed millions of years ago.
- B Millions of people visit the Grand Canyon every year.
- C Scientist Rebecca Flowers enjoys studying Earth's history.
- D Research reveals new clues about the Grand Canyon.

6. How large is the Grand Canyon?

7. How might Rebecca Flowers have felt when she found new evidence about the Grand Canyon. Cite an example from the text to support your answer.

8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

_____ scientists calculated the age of the rocks, they first examined the rocks' chemicals.

- A Because
- B However
- C While
- D Before

9. Answer the following questions based on the sentence below.

Over the years, millions of people have visited Arizona to see the Grand Canyon.

Who? _____

(have done) What? have visited

Where? _____

When? _____

Why? _____

10. **Vocabulary Word:** erosion: the wearing away of Earth's surface by water, wind, or ice.

Use the vocabulary word in a sentence: _____

Teacher Guide and Answers

Passage Reading Level: Lexile 950

Featured Text Structure: Cause/Effect – the writer presents the reason an event happened and its results

Passage Summary: “Big News About Old Rocks” describes how some small rocks from the Grand Canyon recently led scientists to a discovery showing the canyon is much older than once believed.

1. Which of the following statements about the Grand Canyon is NOT true?
 - A The canyon is very old.
 - B The canyon is small.**
 - C The canyon is well-known.
 - D The canyon has rocks.

2. Rebecca Flowers and other scientists used new methods to examine the canyon’s rocks. What was the effect of their work?
 - A They discovered that the canyon was larger than people thought.
 - B They learned that the canyon may be older than once thought.**
 - C They found a new part of the canyon that was hidden from view.
 - D They found evidence that the Colorado River cut through Earth’s crust.

3. What can you conclude after reading the passage?
 - A The Grand Canyon will now receive fewer visitors.
 - B Most geologists will lose interest in the Grand Canyon.
 - C Scientists don’t all agree on when the canyon formed.**
 - D Most scientists agree that the canyon isn’t worth studying.

4. Read this sentence from the passage: “Different [parts] of the canyon evolved at different times,” Flowers told ScienceSpin.
Based on the text, the word **evolved** most nearly means
 - A developed**
 - B disappeared
 - C twisted
 - D advanced

5. Which statement best describes the central idea of this passage?
 - A The Grand Canyon formed millions of years ago.
 - B Millions of people visit the Grand Canyon every year.
 - C Scientist Rebecca Flowers enjoys studying Earth’s history.
 - D Research reveals new clues about the Grand Canyon.**

6. How large is the Grand Canyon?

Suggested answer: The Grand Canyon is 277 miles long, up to 18 miles wide, and more than a mile deep. [paragraph 2]

7. How might Rebecca Flowers have felt when she found new evidence about the Grand Canyon. Cite an example from the text to support your answer.

Suggested answer: Rebecca Flowers might have felt surprised and excited by the new evidence. She says, "The traditional view was that the canyon formed 6 million years ago." [paragraph 1] According to her research, the canyon formed at least 55 million years ago. [paragraph 4]

8. The question below has an incomplete sentence. Choose the word that best completes the sentence.

_____ scientists calculated the age of the rocks, they first examined the rocks' chemicals.

- A Because
- B However
- C While
- D **Before**

9. Answer the following questions based on the sentence below.

Over the years, millions of people have visited Arizona to see the Grand Canyon.

Who? **millions of people**

(have done) What? have visited

Where? **Arizona**

When? **over the years**

Why? **to see the Grand Canyon**

10. **Vocabulary Word:** erosion: the wearing away of Earth's surface by water, wind, or ice.

Use the vocabulary word in a sentence: answers may vary.