

Evidence Changes Ideas

Trace how new ocean-floor evidence reshaped an explanation of Earth.

SC.7.N.2.1 "Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Box the sentence that begins "Many scientists agreed," underline the two sentences in paragraph 2 that begin "Sonar revealed" and "Instruments also recorded," and circle the sentence that begins "Scientists reinterpreted" to trace the old view, new evidence, and revised view.

From Drifting Continents to Moving Plates

- ① In 1912, Alfred Wegener proposed that continents had once been joined and had slowly moved apart. He pointed to matching coastlines, similar fossils on continents now separated by oceans, and rock layers that lined up across the Atlantic. Many scientists agreed that these clues were real, but they rejected Wegener's explanation. He could not identify a force strong enough to move entire continents through the ocean floor. For decades, continental drift remained controversial rather than becoming the accepted explanation of Earth's surface.
- ② In the 1950s and 1960s, new tools allowed scientists to study the ocean floor. Sonar revealed a long chain of underwater mountains, called mid-ocean ridges, where molten rock rose and cooled into new crust. Instruments also recorded matching magnetic stripes on both sides of a ridge, and the youngest crust lay nearest the ridge. These observations showed that ocean crust was spreading outward from the ridges. They provided evidence that Earth's surface was changing in a way Wegener had not been able to explain.
- ③ Scientists reinterpreted Wegener's proposal using this new evidence. Instead of continents pushing through fixed ocean floor, scientists concluded that large plates of Earth's outer layer move. Continents ride on these plates, while new crust forms at ridges and older crust can sink back into Earth elsewhere. This explanation, called plate tectonics, explained both the movement of continents and the patterns found on the ocean floor. The change shows that scientific knowledge can be revised when evidence supports a stronger interpretation.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What was Wegener's original proposal about the continents?

2 Why did many scientists reject Wegener's explanation, even though they accepted his clues?

3 Name two ocean-floor observations that gave scientists new evidence.

4 How did scientists' explanation change after the new ocean-floor evidence was found?

3 YOUR TURN _____ Your own words

Write a three-sentence science-history summary in your own words. Include the earlier explanation, one or more new observations, and the revised explanation from the passage.

PART 1 • READ AND MARK

Box the sentence that begins “Many scientists agreed,” underline the two sentences in paragraph 2 that begin “Sonar revealed” and “Instruments also recorded,” and circle the sentence that begins “Scientists reinterpreted” to trace the old view, new evidence, and revised view. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What was Wegener's original proposal about the continents?	He proposed that the continents had once been joined and had slowly moved apart.
2	Why did many scientists reject Wegener's explanation, even though they accepted his clues?	He could not identify a force strong enough to move entire continents through the ocean floor.
3	Name two ocean-floor observations that gave scientists new evidence.	Sonar showed mid-ocean ridges where molten rock formed new crust. Instruments showed matching magnetic stripes on both sides of a ridge, and the youngest crust was nearest the ridge.
4	How did scientists' explanation change after the new ocean-floor evidence was found?	Scientists changed from the idea of continents pushing through fixed ocean floor to the idea that large plates of Earth's outer layer move. This explanation is called plate tectonics.

PART 3 • YOUR TURN (SAMPLE ANSWER)

At first, many scientists rejected continental drift because Wegener could not explain what moved continents. Later, sonar and magnetic stripes showed that new ocean crust formed at ridges and spread outward. Scientists then explained continental movement as plates moving, an idea called plate tectonics.

Accept equivalent wording that accurately identifies the old explanation, specific new ocean-floor evidence, and the plate tectonics interpretation. For question 3, students must name two distinct observations from the passage.