

Clues Beneath Earth

Read evidence from rocks, fossils, and moving plates.

7.10.A “describe the evidence that supports that Earth has changed over time, including fossil evidence, plate tectonics, and superposition; and”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline one sentence about each type of evidence, then number the evidence 1 for fossils, 2 for plate motion, and 3 for superposition. Circle words that explain what each clue shows about Earth's past.

A Canyon's Changing Story

- ① Earth leaves clues in rock, even though people cannot watch millions of years pass. In a canyon, scientists found a fern fossil in sandstone and a shell fossil in limestone. Fossils are preserved remains, impressions, or traces of organisms that lived long ago. The fern shows that plants once grew there. The shell shows that the area was once covered by water. Together, they show that environments and living things have changed at this place.
- ② Other clues come from Earth's moving plates. The plates are huge pieces of the outer rocky layer. At a divergent boundary, plates move apart and molten rock can rise and cool into new crust. Matching rock layers and mountain belts occur on coastlines now separated by an ocean. Scientists infer that these land areas were once joined and later moved apart as plates shifted. Plate motion is slow, but over millions of years it can rearrange continents and change Earth's surface.
- ③ Rock layers provide another kind of evidence when they have not been turned over or strongly disturbed. The principle of superposition states that in such a stack, a lower layer was deposited before a layer above it. In the canyon, a dark shale layer lies below a pale sandstone layer. Therefore, if the layers are undisturbed, the shale is older than the sandstone. Scientists combine this order with fossils and plate evidence to explain how Earth has changed over time.

2 ANSWER WITH EVIDENCE Use the passage

1 What do the fern and shell fossils reveal about two past conditions in the canyon area?

2 How do matching rock layers and mountain belts on separated coastlines support plate tectonics?

3 The dark shale is below the pale sandstone. What can you conclude if the layers are undisturbed? Use superposition in your answer.

4 How can scientists use fossils, plate motion, and superposition together to describe change on Earth?

3 YOUR TURN Your own words

An undisturbed cliff has a lowest layer with coral fossils, a sandstone layer above it, and an ash layer at the top. Matching rock layers are found on a coastline across an ocean. Write exactly three sentences explaining what the fossils, superposition, and matching layers each reveal about Earth's changes.

PART 1 • READ AND MARK

Underline one sentence about each type of evidence, then number the evidence 1 for fossils, 2 for plate motion, and 3 for superposition. Circle words that explain what each clue shows about Earth's past. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What do the fern and shell fossils reveal about two past conditions in the canyon area?	The fern shows that plants once grew there, and the shell shows that the area was once covered by water.
2	How do matching rock layers and mountain belts on separated coastlines support plate tectonics?	They support the idea that the land areas were once joined and later moved apart as plates shifted.
3	The dark shale is below the pale sandstone. What can you conclude if the layers are undisturbed? Use superposition in your answer.	The dark shale is older because it was deposited before the pale sandstone above it.
4	How can scientists use fossils, plate motion, and superposition together to describe change on Earth?	Fossils show past organisms and environments, plate motion explains changing continents and surface features, and superposition shows the relative order of undisturbed rock layers.

PART 3 • YOUR TURN (SAMPLE ANSWER)

The coral fossils show that the lowest layer formed in a watery environment where coral lived. Because the layers are undisturbed, the coral layer is older than the sandstone and ash layers above it. Matching layers on a distant coastline support the idea that the land areas were once joined and moved apart as tectonic plates shifted.

Accept equivalent evidence-based explanations. For superposition, students must state or use the condition that the layers are undisturbed before concluding that the lower layer is older.