Clues Across Plates

Use Earth data to trace past plate motions.

MS-ESS2-3 "Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline every clue from fossils, rocks, continent shapes or shelves, and seafloor structures. Number each sentence that explains what a clue suggests about plate motion.

Evidence on Land and Sea

1. Earth's continents are not fixed in one place forever. Scientists compare maps, fossils, and rocks to reconstruct past plate motions. The eastern coast of South America and the western coast of Africa have matching curves. Their continental shelves, the shallow edges hidden below the ocean, also fit more closely than the visible coastlines do. This matching shape suggests that the continents were once joined and later moved apart. Shape alone is not enough, so scientists look for other evidence in the same regions.

2. Fossil and rock data add stronger clues. Fossils of Mesosaurus, a freshwater reptile, have been found in both South America and Africa. A freshwater animal could not have crossed a wide saltwater ocean. Rock layers of similar age and type also occur on both sides of the Atlantic Ocean. Together, these data support the idea that the two landmasses were connected when the animal lived and when the rocks formed. As plates moved, the Atlantic widened between them.

3. Data from the ocean floor show how plates continue to move. A long underwater mountain chain called a mid-ocean ridge runs through the Atlantic. New ocean crust forms at ridges, pushing older crust away on both sides. Fracture zones are long breaks that offset sections of a ridge, showing that pieces of crust have moved in different directions. At trenches, one plate bends and sinks beneath another plate. Ridges, fracture zones, and trenches map places where plate motion has shaped the seafloor.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which map feature gives a closer fit than the visible coastlines, and what does that fit suggest?

2. Why do Mesosaurus fossils on both South America and Africa support the idea that the continents were once connected?

3. How do the similar rock layers and the Mesosaurus fossils work together as evidence for past plate motion?

4. Compare what a mid-ocean ridge and a trench indicate about plate motion.

3 YOUR TURN

Your own words

Imagine that the continents Eastvale and Westvale are separated by an ocean: their continental shelves match, both contain 250-million-year-old Glossopteris fossils, and a mid-ocean ridge lies between them. Write exactly three sentences that make a claim about their past motion and explain how all three clues support it.

ANSWER KEY

Clues Across Plates

GRADES 6-8 · MS-ESS2-3

PART 1 · READ AND MARK

Underline every clue from fossils, rocks, continent shapes or shelves, and seafloor structures. Number each sentence that explains what a clue suggests about plate motion. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which map feature gives a closer fit than the visible coastlines, and what does that fit suggest?	**The continental shelves fit more closely. Their fit suggests that South America and Africa were once joined and later moved apart.**
2	Why do Mesosaurus fossils on both South America and Africa support the idea that the continents were once connected?	**Mesosaurus was a freshwater reptile and could not have crossed a wide saltwater ocean, so the landmasses were likely connected when it lived.**
3	How do the similar rock layers and the Mesosaurus fossils work together as evidence for past plate motion?	**Both data sets occur on opposite sides of the Atlantic and support that South America and Africa were connected before plate motion widened the Atlantic.**
4	Compare what a mid-ocean ridge and a trench indicate about plate motion.	**At a mid-ocean ridge, new crust forms and pushes older crust away. At a trench, one plate bends and sinks beneath another plate.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The Eastvale and Westvale plates were once connected and later moved apart. Their matching continental shelves and the same 250-million-year-old Glossopteris fossils suggest that the landmasses were joined. The mid-ocean ridge between them shows that new crust can form and push the plates farther apart.

Accept claims that the continents were once connected and later separated when supported by the matching shelves, matching fossils, and ridge evidence. Students may use equivalent wording for crust forming, spreading apart, or plates moving apart.