Layers on the Move

Model how rock layers form, crack, and shift

E.3.7A.2 "Develop and use models to demonstrate the processes involved in the development of various rock formations, including superposition, and how those formations can fracture and move over time."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Number pebbles, sand, and mud in the order they settled. Underline the sentence that tells how to find the oldest layer in an undisturbed stack, and circle the sentence that tells how the rock moved at the crack.

The Story in a Dry Lake

1. At the edge of a dry lake, rain washes bits of rock into a low basin. Heavy pebbles settle first. Later, slower water drops sand over the pebbles. At last, still water lets fine mud settle on top. Over a very long time, more layers pile up. Their weight presses the loose pieces together, and minerals in water help them stick into rock.

2. These stacked rocks hold clues about time. In a stack that has not been flipped, the lowest layer formed first. This pattern is called superposition. A layer near the top formed after the layers below it. The top layer is not the oldest just because it is easiest to see. A model with labeled layers can show the order in which they formed.

3. Later, a strong push in Earth's crust cracks the rock stack. The crack is called a fault. Rock on one side moves upward while rock on the other side stays lower. Now the same sand layer sits at different heights across the fault. The sand did not form twice. Matching the sand on both sides helps a scientist model how the rock moved after the layers formed.

2 ANSWER WITH EVIDENCE

Use the passage

1. In a model of the rock before the crack, how would you place the three layers from bottom to top?

2. Which layer in your model formed first? How does superposition help you tell?

3. In a model made after the fault moves, should the sand layer meet at the same height on both sides of the crack? Explain.

4. A student says the higher sand layer must have formed later than the lower sand layer. What does matching the sand across the fault show?

3 YOUR TURN

Your own words

Draw two panels showing your own stack of gravel, clay, and ash layers before and after a fault moves one side up. Label the layers and mark the oldest and youngest, then write one sentence explaining how your model shows both superposition and movement.

ANSWER KEY

Layers on the Move

GRADE 3 · E.3.7A.2

PART 1 · READ AND MARK

Number pebbles, sand, and mud in the order they settled. Underline the sentence that tells how to find the oldest layer in an undisturbed stack, and circle the sentence that tells how the rock moved at the crack. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	In a model of the rock before the crack, how would you place the three layers from bottom to top?	**Pebbles on the bottom, sand in the middle, and mud on top.**
2	Which layer in your model formed first? How does superposition help you tell?	**The pebble layer formed first because it is the lowest layer in the undisturbed stack.**
3	In a model made after the fault moves, should the sand layer meet at the same height on both sides of the crack? Explain.	**No. One side moved upward, so the sand layer sits at different heights across the crack.**
4	A student says the higher sand layer must have formed later than the lower sand layer. What does matching the sand across the fault show?	**The sand was one layer before the fault moved. Its two sides are at different heights because the rock shifted.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Panel 1: Three unbroken layers, with gravel at the bottom labeled oldest, clay in the middle, and ash at the top labeled youngest. Panel 2: The same layers are split by a fault, with all three layers higher on the left than on the right. Sentence: The bottom gravel formed first, and the matching layers sit at different heights after the left side moved up.

For the drawing, accept any order of the three new layers if the oldest is at the bottom, the youngest is at the top, and matching layers shift together across the fault. The sentence should explain both the age order and the movement.