Hillside in a Tray

Models can reveal patterns while leaving out details.

5.1.e "developing and using models develop models using an analogy, example, or abstract representation to describe a scientific principle or design solution identify limitations of models"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline words or sentences that tell what the tray model represents or explains. Circle each detail that shows a limit of the model.

A Model of Moving Soil

1. During a rainstorm, water can carry loose soil downhill. To study this process without waiting for rain, Maya built a small model hillside in a tray. She piled damp sand at one end and slowly poured the same amount of water at the top. The water made narrow channels and moved sand toward the bottom of the tray.

2. Her tray was an abstract representation, not a real hill. The sand represented soil, the water represented rain, and the slanted tray represented a slope. Maya used the model to explain that flowing water can erode soil and deposit it farther downhill. Because she kept the water amount the same, she could compare what happened after changing the slope.

3. But the tray model had limits. Its sand grains were more alike than soils in nature, and Maya's smooth water flow did not include wind, plants, rocks, or changing storms. The tray was also much smaller than a hillside. These limits mean the model can show one important pattern, but it cannot predict exactly how every real hill will change.

2 ANSWER WITH EVIDENCE

Use the passage

1. What scientific process does Maya's tray model help explain?

2. Name two parts of the tray model and tell what each part represents.

3. What did Maya keep the same, and how did that make her model useful?

4. Name one limit of Maya's model. What can the model not do because of its limits?

3 YOUR TURN

Your own words

Create a small abstract model to show how a seat belt protects a passenger when a car stops quickly. Write three sentences: describe the model, explain what two parts represent, and name one limitation.

ANSWER KEY

Hillside in a Tray

GRADE 5 · 5.1.e

PART 1 · READ AND MARK

Underline words or sentences that tell what the tray model represents or explains. Circle each detail that shows a limit of the model. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What scientific process does Maya's tray model help explain?	**Flowing water can erode soil and deposit it farther downhill.**
2	Name two parts of the tray model and tell what each part represents.	**The sand represents soil, and the water represents rain. The slanted tray represents a slope.**
3	What did Maya keep the same, and how did that make her model useful?	**She kept the amount of water the same so she could compare what happened after changing the slope.**
4	Name one limit of Maya's model. What can the model not do because of its limits?	**Answers may name the similar sand grains, smooth water flow, missing wind, plants, rocks, or changing storms, or the small size. The model cannot predict exactly how every real hill will change.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

My model uses a toy car, a clay passenger, and a strip of tape across the passenger. The tape represents a seat belt, and the clay represents a person because the tape holds the passenger when the toy car stops. This model does not show the strength of a real seat belt or the force of a real crash.

Accept accurate explanations of what the tray model represents and any limitation stated in the passage. For the open response, accept varied models if the student describes representations and gives a realistic limitation.