Courtyard Water Test

Use a scale model to test a flooding idea.

6.1.e "developing and using models use scale models to represent and estimate distance use, develop, and revise models to predict and explain phenomena evaluate limitations of models"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each sentence that tells how the team used or changed its model, and circle each detail that shows a limit of the model or a way the team checked its prediction.

A Model for Rainy Days

1. At Cedar Middle School, water often puddled near the south doors after heavy rain. A science team built a scale model of the courtyard in a shallow tray. In their model, 1 centimeter represented 1 meter outside. They measured the real walkway as 18 meters long, so they made it 18 centimeters long. They added cardboard walls, a low area, and a small drain. The model helped them represent distances too large for the classroom floor.

2. Next, the team tilted the tray slightly and sprayed the model with the same amount of water each time. Water collected in the low area, which suggested that runoff could reach the doors. But the first model did not include a mulch bed beside the walkway. Outside, that bed absorbs some rain. The team revised the model by adding a sponge piece for the mulch bed. In the revised test, less water reached the doorway. The revised model predicted that improving the mulch bed might reduce puddles.

3. A model cannot copy every condition in a real courtyard. The tray had no wind, changing soil moisture, leaves, or clogged drains. Its cardboard walls could not show cracks in pavement, and the sponge did not absorb water exactly like real mulch. The team compared its prediction with observations after the next storm. Water still gathered near one corner, so they learned that their model needed another low area. Models are useful for testing ideas, but their limits mean predictions must be checked with real evidence.

2 ANSWER WITH EVIDENCE

Use the passage

1. Using the team's scale, what model length represented the 18-meter walkway?

2. What did water collecting in the low area help the team predict?

3. Why did the team revise its first model, and what happened in the revised test?

4. Name two limits of the tray model. How did the team check whether its prediction was useful?

3 YOUR TURN

Your own words

Choose a place where rainwater could collect, such as a sidewalk, garden, or field. In the box, draw a scale model with a key and label two real distances and their model distances, then write two sentences that predict water movement and name one limitation and one revision.

ANSWER KEY

Courtyard Water Test

GRADE 6 · 6.1.e

PART 1 · READ AND MARK

Underline each sentence that tells how the team used or changed its model, and circle each detail that shows a limit of the model or a way the team checked its prediction. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Using the team's scale, what model length represented the 18-meter walkway?	**18 centimeters.**
2	What did water collecting in the low area help the team predict?	**It suggested that runoff could reach the south doors.**
3	Why did the team revise its first model, and what happened in the revised test?	**The first model left out the mulch bed, which absorbs some rain. The team added a sponge piece to represent it, and less water reached the doorway.**
4	Name two limits of the tray model. How did the team check whether its prediction was useful?	**Answers may name any two: no wind, changing soil moisture, leaves, clogged drains, pavement cracks, or exact mulch absorption. The team compared its prediction with observations after the next storm.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Sketch labels: Scale, 1 cm = 1 m; sidewalk, 12 m real and 12 cm model; garden strip, 4 m real and 4 cm model; low corner. Water will move from the sidewalk toward the low corner beside the garden strip. The model does not include soil absorption, so I would add a sponge to represent the garden soil.

Accept equivalent scale calculations when the model distance matches the stated scale. For the open task, accept any reasonable rainwater prediction, provided the student includes a scale key, two matching real and model distances, a limitation, and a revision.