

Tray to Terrain

Use a small model to show how water moves over land.

3.1.G “develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each phrase that tells what a part of the tray model represents. Circle the sentence that tells how the model helped the class explain a real process.

A Garden in a Tray

- ① When rain falls on the school garden, some water soaks into the soil. Other water runs downhill. Ms. Lee's class wanted to show this process without waiting for a rainy day. They built a model in a shallow tray. The model was smaller than the garden, but it could show how water moves across land.
- ② First, the class pressed damp soil into one end of the tray and raised that end with books. The high end represented a hill. The low end represented flat ground. They slowly poured water at the top. Then they watched the water travel down the slope. A pencil line in the soil showed the path the water made.
- ③ The class changed one part of the model next. They packed the soil tightly, then they repeated the water test. Less water soaked in, and more water ran over the top. The model helped the class compare two kinds of soil. It did not look exactly like a whole garden. Still, its hill, soil, and water helped explain the real process.

2 ANSWER WITH EVIDENCE Use the passage

1 What real process did the tray model represent?

2 What part of the model represented a hill? What part represented flat ground?

3 What did the class do to use the model to show where water moved?

4 How did changing the soil help the class compare two kinds of soil?

3 YOUR TURN Your own words

Plan a small model that shows how wind can move loose sand. Write 3 or 4 sentences that name your materials, tell what at least two parts represent, and explain what you will watch happen. Then actually develop and use a drawn model on extra paper. Draw BEFORE and AFTER panels of loose sandy ground. Label sand grains, a wind-direction arrow and a place where grains may collect; explain what at least two marks represent. Use your arrows and grain locations to predict the direction wind moves the sand and explain your prediction to a partner. Change your wind arrow to the opposite direction and use the model to predict a different collection place. State one limit of the drawing, such as not showing exact distance or how strong the wind is. No blowing loose sand is required.

PART 1 • READ AND MARK

Underline each phrase that tells what a part of the tray model represents. Circle the sentence that tells how the model helped the class explain a real process. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What real process did the tray model represent?	It represented rainwater soaking into soil and running downhill across land.
2	What part of the model represented a hill? What part represented flat ground?	The raised, high end of the tray represented a hill. The low end represented flat ground.
3	What did the class do to use the model to show where water moved?	They poured water at the top of the slope, watched it travel down, and used a pencil line to show its path.
4	How did changing the soil help the class compare two kinds of soil?	After they packed the soil tightly, less water soaked in and more water ran over the top.

PART 3 • YOUR TURN (SAMPLE ANSWER)

I will put dry sand in a shallow tray and use a paper fan. The sand represents loose ground, and the moving air from the fan represents wind. I will watch where the sand moves and mark the new pile. Drawn-model example: Before, grains are at the left and a right-pointing arrow represents wind. After, some grains collect farther right. Reversing the arrow predicts movement toward the left. These are model predictions, not observations of a performed sand test. The drawing does not determine an exact distance or real wind strength.

Accept answers that correctly connect parts of the tray to the real garden and describe the water movement. For the open task, accept workable models that name materials, explain at least two representations, and identify an observable change. Require an actual labeled representation, correspondence of at least two parts, use of the model for both directional predictions and one appropriate limitation. Accept different orientations when arrows and predicted movement agree. The original materials plan remains useful, but plan sentences alone are insufficient. Drawing is a legitimate model; physical sand/fan use is not compulsory.