

Stop the Soil

Use evidence from data and models to explain a problem and propose a solution.

5.3.A “develop explanations and propose solutions supported by data and models;”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each piece of data or model evidence, circle the explanation of the problem, and box the proposed solution. These marks show how evidence supports a scientific solution.

Rainwater and Garden Soil

- ① Students at Pine Hill noticed muddy water crossing a sidewalk after rain. They wondered why one garden bed lost more soil than another. For three storms, they placed trays at the ends of two beds and measured the soil collected. The data are shown below.

SOIL COLLECTED AFTER THREE STORMS

Garden bed	Soil collected, cups
Bare soil	9
Covered with mulch	2

- ② To test an explanation, the students made a model with two sloped trays. One tray held bare soil, and the other had soil covered with leaves. They poured the same amount of water onto each tray. Water carried more soil from the bare tray. The model showed that leaves can slow moving water and help hold soil in place.
- ③ The group explained that rainwater moved quickly across bare soil, carrying soil away. Their tray model and the 9 cups collected from the bare bed supported this explanation. They proposed covering the bare bed with leaves or mulch. Because the mulched bed collected only 2 cups, they predicted that this change would reduce soil washing onto the sidewalk.

2 ANSWER WITH EVIDENCE Use the passage

1 What two soil amounts support the claim that mulch reduces soil loss?

2 How did the sloped-tray model test the students' explanation?

3 What was the group's explanation for why soil washed onto the sidewalk? Include one piece of supporting evidence.

4 What solution did the group propose, and what did they predict would happen?

3 YOUR TURN Your own words

At Maple School, a bare hill sent 8 cups of soil into a drain after two storms. A nearby grassy hill sent 1 cup. In the two panels, draw labeled models showing how water moves on each hill. Then write two sentences that explain the data and propose one solution for the bare hill.

PART 1 • READ AND MARK

Underline each piece of data or model evidence, circle the explanation of the problem, and box the proposed solution. These marks show how evidence supports a scientific solution. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What two soil amounts support the claim that mulch reduces soil loss?	The bare-soil bed collected 9 cups, and the mulched bed collected 2 cups.
2	How did the sloped-tray model test the students' explanation?	The students poured the same amount of water onto bare soil and leaf-covered soil. More soil washed from the bare tray.
3	What was the group's explanation for why soil washed onto the sidewalk? Include one piece of supporting evidence.	Rainwater moved quickly across bare soil and carried soil away. The bare bed collected 9 cups of soil, and the model also showed more soil washing from bare soil.
4	What solution did the group propose, and what did they predict would happen?	They proposed covering the bare bed with leaves or mulch. They predicted that less soil would wash onto the sidewalk.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1: A bare sloped hill with rain and fast water arrows carrying soil into a drain. Panel 2: A grassy sloped hill with rain, slower water arrows, and little soil reaching a drain. The bare hill lost more soil because water moved over uncovered soil and carried it to the drain. Planting grass or adding mulch should reduce soil loss because the grassy hill sent 1 cup of soil while the bare hill sent 8 cups.

Accept explanations that connect faster or less-blocked water movement on bare soil to greater soil loss and that use the given amounts as evidence. Accept solutions such as planting grass, adding mulch, or covering the soil, if the student predicts reduced soil loss and supports the prediction with the data or model.