Slope Sleuths

Use observations and measurements as evidence of water erosion.

4-ESS2-1 "Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the observations and measurements that show water erosion. Circle the factor the class changed, then number the things it kept the same.

A Fair Slope Test

1. After a hard rain, Maya noticed muddy water moving down a bare hill beside the playground. She and her class wondered how the angle of a slope affects erosion by water. Erosion happens when moving water carries soil or rock from one place to another. They planned a model investigation using two trays of the same soil, the same amount of water, and different slope angles.

2. They raised one tray so its soil surface had a steep angle. The other tray had a gentle angle. A student poured one cup of water at the top of each tray over the same amount of time. Then the class observed the soil left in each tray and measured the muddy water collected below. They recorded their observations in a table, including the amount of soil that had moved.

3. The steep tray had a deeper channel and less soil left near its top. Its collected water looked muddier, and the class measured more moved soil in its container. The gentle tray had a smaller channel and less soil in the collected water. These observations are evidence that, in this model, water eroded soil faster on the steeper slope. The class changed only slope angle, so they could compare fairly.

2 ANSWER WITH EVIDENCE

Use the passage

1. What variable did the class change in its water erosion investigation?

2. Name two conditions the class kept the same for both trays.

3. Give two observations or measurements that show more erosion happened in the steep tray.

4. What conclusion did the class make from its evidence?

3 YOUR TURN

Your own words

Plan a water erosion test using two soil trays. In 3 or 4 sentences, name one factor to change, two things to keep the same, one measurement or observation to record, and the result that would support your prediction. Then carry out an approved test with your teacher, or observe the teacher doing it. Suggested setup: two identical soil trays inside a catch basin, one end raised 2 cm versus 5 cm. Use equal soil amounts, moisture and packing. Pour the same measured cup of water onto each top over the same 10 seconds. Before and after each pour, sketch the channels and soil movement on separate paper. Label actual changes for each tray. Write two more sentences comparing your evidence and whether it supports your prediction; report unclear or unexpected results honestly. Keep soil out of eyes and wash hands.

ANSWER KEY # Slope Sleuths

GRADE 4 · 4-ESS2-1

PART 1 · READ AND MARK

Underline the observations and measurements that show water erosion. Circle the factor the class changed, then number the things it kept the same. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What variable did the class change in its water erosion investigation?	**The class changed the angle of the slope.**
2	Name two conditions the class kept the same for both trays.	**The class kept the soil and amount of water the same. It also poured the water for the same amount of time.**
3	Give two observations or measurements that show more erosion happened in the steep tray.	**The steep tray had a deeper channel and less soil near its top. Its collected water was muddier, and it contained more moved soil.**
4	What conclusion did the class make from its evidence?	**In this model, water eroded soil faster on the steeper slope.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I will test how grass cover changes water erosion. One tray will have grass, and one tray will have bare soil. I will keep the slope and amount of water the same, then measure the soil collected after each pour. My prediction is that the bare tray will collect more soil, showing more water erosion. Completed observation example for that grass-cover plan, not required results: the grass-covered tray had a small channel, while the bare tray had a deeper channel and more soil moved downhill during the same pour time. These observations support greater erosion in the bare tray in this test; repeating the test would strengthen the comparison.

For Question 2, accept same soil, same amount of water, and same pouring time. For the open task, accept any safe, testable water erosion plan with one changed factor, two controls, an observation or measurement, and evidence connected to a prediction. Also require the completed supported test/demonstration, labeled before/after observations for both trays and two evidence-based conclusion sentences. If using a different approved factor, keep the remaining conditions matched. Accept no clear difference or a reversed result when that is what was observed. Do not substitute the passage or invented measurements for actual observations. One paired trial provides limited evidence, not a universal rule.