

Stop the Soil

Plan a fair observation test, then use evidence to design a solution.

4.1.B “use scientific practices to plan and conduct descriptive investigations and use engineering practices to design solutions to problems;”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the investigation question, circle the actions that make the test fair, and number the observations that help the team design a solution.

A Garden Runoff Test

- ① After heavy rain, soil from the school garden washed onto the sidewalk. A fourth-grade team wanted to learn which ground cover could slow the water. They asked, “How does bare soil compare with soil covered by leaves?” Their investigation would be descriptive. They would carefully observe changes and record clear details in a science notebook during each test.
- ② To make a fair plan, the team filled three shallow trays with the same kind and amount of soil. They left one tray bare, covered one with dry leaves, and covered one with grass clippings. They placed each tray at the same slant. One student slowly poured the same cup of water over each tray. Others wrote observations about moving soil and cloudy water.
- ③ The team repeated the test two more times. In the bare tray, they saw the most soil move, and the water looked muddiest. The leaf-covered tray lost less soil. Using these observations, the team designed a solution: cover garden soil with leaves after planting. They planned to test the cover after the next rain and improve it if soil still reached the sidewalk.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What two soil conditions did the team compare in their investigation question?

2 Name two actions the team took to make the test fair.

3 What observations did the students write down during the test?

4 Which result supported the leaf-cover solution, and what did the team plan to do next?

3 YOUR TURN _____ Your own words

Choose a problem at school that could be improved with a simple solution. Write a descriptive investigation plan that includes a question, a fair comparison, observations you will record, and how you will use the observations to choose and test a solution.

PART 1 • READ AND MARK

Underline the investigation question, circle the actions that make the test fair, and number the observations that help the team design a solution. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What two soil conditions did the team compare in their investigation question?	Bare soil and soil covered by leaves.
2	Name two actions the team took to make the test fair.	Answers include using the same kind and amount of soil, placing trays at the same slant, and pouring the same cup of water over each tray.
3	What observations did the students write down during the test?	They observed moving soil and cloudy water.
4	Which result supported the leaf-cover solution, and what did the team plan to do next?	The leaf-covered tray lost less soil. The team planned to test leaf cover after the next rain and improve it if soil still reached the sidewalk.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Our classroom plant stand has puddles after watering. My question is, "Does a tray or an absorbent mat under a pot keep the floor drier?" I will put two similar potted plants on the same kind of floor, give each the same amount of water, and check after ten minutes. I will record whether the floor is wet and describe any puddle. I will choose the option with a dry floor and test it again.

Accept a school problem with a testable question, a fair comparison that controls important conditions, and planned descriptive observations. The solution should be chosen from the observations and include a plan to test or improve it.