

Garden Design Detectives

Use questions, limits, and simple tests to solve a garden problem.

LS.1.a.ii "asking questions and defining problems offer simple solutions to design problems"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the sentence that defines the design problem, circle the four questions the class asks, and number the two proposed solutions 1 and 2. These marks show how questions and problem statements lead to possible solutions.

Watering the Bean Bed

- ① At Riverbend Middle School, a raised-bed garden produced fewer bean plants than expected. Students did not start by guessing a fix. They defined the design problem: create a way for the garden to hold enough water for bean seedlings during hot weeks without wasting water. A clear problem statement named the user, the need, and limits. The gardeners needed a solution that was inexpensive, safe near food plants, and simple for students to maintain during class time each week.
- ② Before choosing materials, the class asked questions that could guide a solution. How dry does the soil become between waterings? How much water do bean seedlings need? Which parts can be reused? How often can students check the bed? These questions gathered information about the need and constraints. The class found that the soil dried quickly at the surface, and students could inspect the garden only twice a week. A useful question can be investigated and can help a designer make a choice.
- ③ Using their findings, teams suggested simple solutions. One team proposed covering the soil with a layer of dry leaves, called mulch. Mulch can slow evaporation, so less water leaves the soil. Another team suggested a reused plastic bottle with tiny holes near its bottom. Filled bottles could release water slowly beside seedlings. The class chose to test one small section before changing the whole bed. Testing lets designers observe whether a solution meets the need and limits before they use it widely.

2 ANSWER WITH EVIDENCE Use the passage

1 What is the garden design problem? Include the need and two limits named in the passage.

2 Which class question would help designers decide whether they can maintain a reused-bottle watering system? Explain why.

3 What observation gave the class a reason to consider a solution that slows evaporation?

4 Why did the class test a small section before changing the whole garden bed?

3 YOUR TURN Your own words

A classroom has small seedling pots that dry out over a three-day weekend. Write a problem statement with one limit, ask two questions that could be investigated, and propose one simple solution.

PART 1 • READ AND MARK

Underline the sentence that defines the design problem, circle the four questions the class asks, and number the two proposed solutions 1 and 2. These marks show how questions and problem statements lead to possible solutions. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What is the garden design problem? Include the need and two limits named in the passage.	Create a way to keep enough water for bean seedlings during hot weeks without wasting water. The solution must be inexpensive, safe near food plants, and simple for students to maintain during class time.
2	Which class question would help designers decide whether they can maintain a reused-bottle watering system? Explain why.	"How often can students check the bed?" It shows how often students could inspect or refill the bottles.
3	What observation gave the class a reason to consider a solution that slows evaporation?	The soil dried quickly at the surface between waterings.
4	Why did the class test a small section before changing the whole garden bed?	Testing let them observe whether a solution met the need and limits before using it widely.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Create a way to keep the seedling pots moist over a three-day weekend without using electricity. How much water does one pot lose in three days? Which reused container can release water slowly? A bottle of water with a cotton wick leading into each pot could provide water slowly.

Accept problem statements that name a need and at least one realistic limit. Accept investigable questions and a simple solution that reasonably connects to the stated problem and limits.