

Stop the Drips

Use questions, limits, and simple ideas to define a design problem.

6.1.a.iii "asking questions and defining problems offer simple solutions to design problems"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Circle each question the team asks, underline the team's problem statement, and number the three possible solutions. These marks show how questions and a clear problem can lead to design ideas.

A Slippery Fountain

- ① At Riverside Middle School, students noticed that the water fountain near the gym often formed a puddle. The puddle made the floor slippery, and some students stepped around it during passing time. The design team did not begin by building something. First, they watched the fountain after different students used it. They wrote down what they saw: water splashed from the basin, and drips fell from the bottle-filling spout onto the tile. They also checked whether a custodian had recently mopped the area.
- ② Next, the team asked questions that could guide a solution. Where does the water first land? How much space is available beside the fountain? Could a device be cleaned easily? Their problem statement became: Design a way to keep water off the tile near the gym fountain without blocking students or making drinking harder. The statement named the unwanted effect, the location, and limits. It did not name one required object, so the team could consider more than one idea for testing.
- ③ For a first round, the team sketched three simple solutions: a narrow rubber mat with a raised edge, a small sloped tray that sends drips into the basin, and a short guard around the bottle-filling spout. They decided to test models with a cup of water. A useful solution would catch or guide water, fit the available space, stay easy to clean, and allow students to reach the fountain. Testing could show which idea needs changes before use.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Use two observations from the passage to explain why the team needed a design solution.

2 What problem did the team define? Include one limit the solution must meet.

3 Choose one question the team asked that is about a limit on the solution. Explain what limit it checks.

4 Name one simple solution the team sketched and one way the team would decide whether it worked.

3 YOUR TURN _____ Your own words

Choose a different small school design problem. Write two questions you would ask, a one-sentence problem statement with one limit, and one simple solution.

PART 1 • READ AND MARK

Circle each question the team asks, underline the team's problem statement, and number the three possible solutions. These marks show how questions and a clear problem can lead to design ideas. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Use two observations from the passage to explain why the team needed a design solution.	Water splashed from the basin, and drips fell from the bottle-filling spout onto the tile. These caused a slippery puddle.
2	What problem did the team define? Include one limit the solution must meet.	The team needed to keep water off the tile near the gym fountain. The solution could not block students or make drinking harder.
3	Choose one question the team asked that is about a limit on the solution. Explain what limit it checks.	Answers may name "How much space is available beside the fountain?" because a solution must fit there, or "Could a device be cleaned easily?" because it must be easy to clean.
4	Name one simple solution the team sketched and one way the team would decide whether it worked.	Answers may name the raised-edge mat, sloped tray, or short guard. The team would test a model with a cup of water and check whether it caught or guided water while meeting the other limits.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Pencils roll off a supply table during art class. How often do pencils fall, and how much table space can a holder use? Design a way to keep pencils on the table without taking up space needed for projects. A low cardboard tray with sections could hold the pencils.

Accept varied school problems if the student includes two useful questions, a clear problem statement with a limit, and a simple solution connected to the problem. Questions should help identify the cause, location, users, materials, space, safety, or another design limit.