

Waste Wise Design

Define a school design problem by using needs, criteria, and constraints.

5.1.a.iii "asking questions and defining problems define design problems that can be solved through the development of an object, tool, process, or system"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the design problem in the passage. Circle the requirements a solution must meet, then number the three possible solution ideas 1, 2, and 3.

A Lunch Waste Challenge

- ① At Maple Grove School, the lunch helpers noticed that unopened milk cartons and whole apples often landed in the trash. They decided to define a design problem, not simply complain about waste. First, they gathered facts. For five days, they counted untouched foods after lunch and asked students why they did not take or finish certain items.
- ② The group wrote this problem: How can we create a simple system that helps students choose lunch items they will use, so less food is thrown away? A useful solution must be easy for students and cafeteria workers to use. It must fit the school's food safety rules, use little extra time, and cost no more than the lunch team can afford.
- ③ Next, the helpers listed possible ways to solve the problem. They considered a reusable choice board near the serving line, a process for students to order lunch choices earlier, and a system that shares daily counts with the kitchen. Before choosing, they planned to test ideas with students and workers. They would compare each idea with their goal, rules, time limit, and budget.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What observations showed the lunch helpers that there was a problem to solve?

2 What is the goal of the design problem the group wrote?

3 Name two requirements that any solution must meet.

4 Which possible solution is a process? Explain what students would do in that process.

3 YOUR TURN _____ Your own words

Choose a different school problem that could be solved by an object, tool, process, or system. Describe the problem, write a design-problem question, name two criteria for a good solution, name one constraint, and state the kind of solution you would create.

PART 1 • READ AND MARK

Underline the design problem in the passage. Circle the requirements a solution must meet, then number the three possible solution ideas 1, 2, and 3. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What observations showed the lunch helpers that there was a problem to solve?	Unopened milk cartons and whole apples often landed in the trash.
2	What is the goal of the design problem the group wrote?	To help students choose lunch items they will use so less food is thrown away.
3	Name two requirements that any solution must meet.	Answers may include: easy for students and cafeteria workers to use, follows food safety rules, takes little extra time, or costs no more than the lunch team can afford.
4	Which possible solution is a process? Explain what students would do in that process.	Students would order their lunch choices earlier.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Students sometimes cannot find library books that were returned to the wrong shelf. How can we create a tool that helps students and librarians put returned books in the correct place? It should be easy to read and quick to use, and it must cost less than \$30.

For Questions 2 and 3, accept equivalent wording that keeps the passage's goal, criteria, and constraints. For the open task, accept any realistic school problem if the student includes a clear design question, two criteria, one constraint, and a stated object, tool, process, or system.