

Where Did Sugar Go?

Compare substances and track matter in a solution.

5.6.C “compare the properties of substances before and after they are combined into a solution and demonstrate that matter is conserved in solutions; and”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline details that describe a substance before or after mixing. Circle every mass amount to show how matter is conserved.

Sugar and Water Investigation

- ① At science club, Maya measured 100 grams of water in a cup and 20 grams of sugar in a dry dish. The water was a clear liquid with no sweet taste. The sugar was made of white, grainy crystals and tasted sweet. She covered the cup so that no water could splash out or evaporate during the investigation.
- ② After Maya stirred the sugar into the water, the crystals could no longer be seen. The cup held a clear, sweet solution, a mixture in which the sugar was spread evenly through the water. Its mass was 120 grams. The solution had different observable properties from either starting substance, but it contained both water and sugar.
- ③ Maya did not make new matter by stirring. The 100 grams of water plus the 20 grams of sugar equaled the 120 grams of solution. Matter is conserved when substances form a solution, as long as none enters or leaves the system. If an uncovered cup loses water vapor, the cup may weigh less, even though the water still exists in the air.

2 ANSWER WITH EVIDENCE Use the passage

- 1 Name one property of the sugar before mixing and one property of the solution after mixing.

- 2 How do the mass measurements show that matter was conserved?

- 3 What happened to the sugar crystals after Maya stirred them into the water? Explain why this does not mean the sugar disappeared.

- 4 Why might an uncovered cup weigh less after mixing, even though matter is conserved?

3 YOUR TURN Your own words

Imagine mixing 60 grams of water and 15 grams of salt in a covered cup. Write three sentences that describe the substances before mixing, describe the solution after stirring, and explain what mass you expect and why.

PART 1 • READ AND MARK

Underline details that describe a substance before or after mixing. Circle every mass amount to show how matter is conserved. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Name one property of the sugar before mixing and one property of the solution after mixing.	Before mixing, the sugar was white, grainy crystals. After mixing, the solution was clear and sweet.
2	How do the mass measurements show that matter was conserved?	The masses of the starting substances, 100 grams and 20 grams, add to 120 grams, the mass of the solution.
3	What happened to the sugar crystals after Maya stirred them into the water? Explain why this does not mean the sugar disappeared.	The crystals could no longer be seen because the sugar spread evenly through the water. The sugar was still in the solution.
4	Why might an uncovered cup weigh less after mixing, even though matter is conserved?	Water vapor may leave the cup and enter the air. The cup weighs less, but the water still exists, so matter is conserved in the larger system.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Before mixing, the water is a clear liquid and the salt is white crystals. After stirring, the crystals are no longer visible, and the solution is clear. The covered cup should have a mass of 75 grams because 60 grams plus 15 grams equals 75 grams.

Accept accurate comparisons of properties named in the passage, including clear liquid, white grainy crystals, sweet solution, and crystals no longer visible. For conservation explanations, students should add the starting masses and note that matter stays conserved when none enters or leaves the system.