Where Did It Go?

Use mass data to track matter in open and closed systems.

P.7.5E.2 "Analyze data from investigations to explain why the total mass of the product in an open system appears to be less than the mass of reactants."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB In each table row, underline the starting mass and circle the ending mass. In the final paragraph, underline the sentence that explains the open cup's lower ending mass and circle the sentence that explains the sealed bag's unchanged mass.

The Case of the Missing Mass

1 A science club tested whether a fizzy tablet makes matter disappear. In each trial, students measured the mass of the ingredients before the tablet touched water. They then waited until the bubbling stopped and measured what remained. For each setup, they subtracted the container's mass, so their numbers show only its contents.

2 The open cup let bubbles rise into the room. The sealed bag kept its bubbles inside, even after the fizzing stopped. The club used the same amounts of water and tablet in these two trials. A third trial used only water in an open cup. The table shows their measurements in grams.

SCIENCE CLUB MASS MEASUREMENTS

Setup	Starting mass (g)	Ending mass (g)
Fizzy tablet and water, open cup	104.0	102.2
Fizzy tablet and water, sealed bag	104.0	104.0
Water only, open cup	100.0	100.0

3 The bubbles were gas made during the reaction. In the open cup, some of that gas crossed the cup's edge and was not included in the final measurement. The sealed bag held the gas with the other products. Comparing starting and ending masses can reveal whether matter left the area being weighed, not whether matter vanished.

2 ANSWER WITH EVIDENCE

Use the passage

1. How much lower was the ending mass in the open fizzy-tablet trial? Explain where that mass went.

2. Compare the starting and ending masses in the sealed-bag trial. How does the passage explain this result?

3. What happened to the measured mass of the open cup that held only water? What does this suggest about the lower mass in the open fizzy-tablet trial?

4. A student claims the fizzy reaction destroyed some matter. Use both fizzy-trial rows to evaluate that claim.

3 YOUR TURN

Your own words

A different group mixes vinegar and baking soda. Both trials start with 80.0 g of ingredients. An open container ends at 77.5 g, while a sealed container ends at 80.0 g. In three sentences, explain what the data suggest happened to the missing mass and describe one way to test your explanation.

Where Did It Go?

PART 1 · READ AND MARK

In each table row, underline the starting mass and circle the ending mass. In the final paragraph, underline the sentence that explains the open cup's lower ending mass and circle the sentence that explains the sealed bag's unchanged mass. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How much lower was the ending mass in the open fizzy-tablet trial? Explain where that mass went.	**The ending mass was 1.8 g lower. Gas made during the reaction escaped from the open cup.**
2	Compare the starting and ending masses in the sealed-bag trial. How does the passage explain this result?	**Both masses were 104.0 g. The bag kept the gas with the other products.**
3	What happened to the measured mass of the open cup that held only water? What does this suggest about the lower mass in the open fizzy-tablet trial?	**The water-only mass stayed at 100.0 g. The lower mass in the fizzy-tablet trial was not caused simply by using an open cup.**
4	A student claims the fizzy reaction destroyed some matter. Use both fizzy-trial rows to evaluate that claim.	**The claim is not supported. The open trial measured 1.8 g less at the end, but the sealed trial stayed at 104.0 g because it held the gas.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The open container measured 2.5 g less, while the sealed container did not lose measured mass. Gas produced by the reaction likely escaped from the open container. I would attach a balloon before the reaction, then weigh the container and balloon together before and after to see whether their total mass stays the same.

Accept explanations that identify escaped gas as the reason the open trial's measured mass decreased, without claiming matter was destroyed. For the open task, a valid test must capture or include the gas in the final measurement.