LESSON MAKER PRO

Where Did It Go?

Use mass to investigate matter you cannot see.

GRADE 5 · 5.1

5.1 "Plan and carry out investigations to provide evidence that matter is made of particles too small to be seen."

NAME _____ DATE _____

A MASS CHECK

The particles that make up a solid are already too small to see. When the solid dissolves, its particles spread through the liquid. Measure the mass of a sealed container before and after mixing to check whether any matter was lost.

WORKED EXAMPLE

A jar, lid, and water weigh 34 g. You add 7 g of sugar and seal the jar. What mass should you measure after the sugar dissolves?

1. Start with the mass of the jar, lid, and water: 34 g.
2. Add the sugar's mass: 34 g + 7 g = 41 g.
3. Keep the jar sealed while the sugar dissolves, then measure again.

Answer: 41 g

PRACTICE 6 problems

1 A bottle with its cap and water has a mass of 52 g. You add 8 g of salt, replace the cap, and shake. What should its mass be after the salt dissolves?

ANSWER _____

2 Use the mass check to find how many grams of salt were added to the closed cup.

CLOSED CUP MASS CHECK

Stage	Mass
Cup, lid, and water	63 g
Sealed cup after salt dissolves	72 g

ANSWER _____

3 In which container did the mass stay the same after mixing? Give its before-and-after masses as evidence.

MASS BEFORE AND AFTER MIXING

Closed container	Before	After
A	80 g	80 g
B	85 g	83 g

ANSWER _____

4 A sealed bag holds a cup of water and a small packet of salt. You can open the packet inside the bag without opening the bag. What two measurements should you make to check whether the salt's matter remains after it dissolves?

ANSWER _____

5 A pouch, its water, and 6 g of sugar have a total mass of 53 g before mixing. The sealed pouch still weighs 53 g after the sugar dissolves. How many grams of matter were lost?

ANSWER _____

6 A container with its lid and water weighs 95 g. You add 5 g of salt and close it. After mixing, it weighs 100 g. How much did the mass increase, and what does that tell you about the salt you can no longer see?

ANSWER _____

APPLY IT Show your work

1 At a lemonade stand, a bottle, cap, and water weigh 108 g. You add 12 g of lemonade powder and replace the cap. What should the sealed bottle weigh after you shake it? What scale reading would support the idea that the powder's matter remains?

WORK SPACE

ANSWER _____

2 For a science fair, Mia places 18 g of drink powder in a small cup inside a sealed jar of water. The entire setup weighs 245 g. She tips the jar to mix the powder without opening it. After mixing, it still weighs 245 g. If the powder's matter had vanished, how much would the setup weigh? Explain what Mia's measurement shows.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two teams put a fizz tablet in water. The tablet dissolves and makes gas. How much less mass did the open jar have after mixing? Which setup gives better evidence that matter remains even when you cannot see it? Use the masses to explain.

FIZZ TABLET INVESTIGATION

Setup	Before mixing	After mixing
Sealed jar	164 g	164 g
Open jar	164 g	159 g

WORK SPACE AND ANSWER

Where Did It Go?

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A bottle with its cap and water has a mass of 52 g. You add 8 g of salt, replace the cap, and shake. What should its mass be after the salt dissolves?	**60 g**
2	Use the mass check to find how many grams of salt were added to the closed cup.	**9 g**
3	In which container did the mass stay the same after mixing? Give its before-and-after masses as evidence.	**Container A; its mass was 80 g before and 80 g after mixing.**
4	A sealed bag holds a cup of water and a small packet of salt. You can open the packet inside the bag without opening the bag. What two measurements should you make to check whether the salt's matter remains after it dissolves?	**Measure the mass of the sealed bag and everything inside it before mixing. Measure the mass of the same sealed bag and its contents after the salt dissolves.**
5	A pouch, its water, and 6 g of sugar have a total mass of 53 g before mixing. The sealed pouch still weighs 53 g after the sugar dissolves. How many grams of matter were lost?	**0 g**
6	A container with its lid and water weighs 95 g. You add 5 g of salt and close it. After mixing, it weighs 100 g. How much did the mass increase, and what does that tell you about the salt you can no longer see?	**The mass increased by 5 g. The salt's matter is still in the container.**

PART 2 · APPLY IT

1. **It should weigh 120 g. A reading of 120 g after shaking would support the idea that the powder's matter remains.** Add 108 g and 12 g to get 120 g. Compare that expected mass with the mass measured after shaking.
2. **It would weigh 227 g if the powder's matter had vanished. The measured mass stayed at 245 g, which supports that the powder's matter remains in the jar.** Subtract the powder's mass: 245 g - 18 g = 227 g. The unchanged measurement does not support the claim that its matter vanished.

CHALLENGE

The open jar had 5 g less mass after mixing. The sealed jar gives better evidence because its mass stayed at 164 g, while gas could leave the open jar.

Accept equivalent wording that identifies the whole sealed setup as what students must weigh. The unchanged mass supports the conclusion that matter remains, even when the dissolved solid is no longer visible.