LESSON MAKER PRO

Where Did It Go?

Use mass measurements to track matter through changes.

GRADE 5 · 5-PS1-2

5-PS1-2 "Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total mass of matter is conserved. (SEP: 5; DCI: PS1.A, PS1.B; CCC: Scale/Prop.)"

NAME _____ DATE _____

COUNT ALL THE MATTER

To test whether mass is conserved, compare the total mass before a change with the total mass after it. Add the masses of all the parts, and count a container on both sides or leave it out on both sides. In a sealed container, matter cannot enter or leave.

WORKED EXAMPLE

A scale is set to ignore the mass of a sealed jar. Inside are 17 g of drink powder and 29 g of water. What mass will the scale show after the jar is shaken?

1. Add the masses before mixing: 17 g + 29 g = 46 g.
2. The jar is sealed, so no matter can enter or leave.
3. The mass after mixing is 46 g.

Answer: 46 g

PRACTICE 6 problems

1 A sealed bag contains 24 g of sand and 31 g of small stones. What is the total mass of the sand and stones?

ANSWER _____

2 A closed container has a mass of 72 g after a sugar cube dissolves in water. What was the mass of the container and everything in it before the sugar dissolved?

ANSWER _____

3 Use the table. How many grams did the mass change as the jar cooled? Give one measurement as evidence.

SEALED JAR DURING COOLING

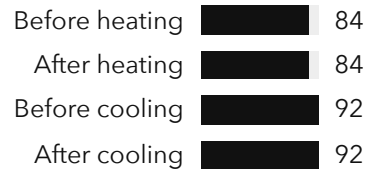
Time	Jar and contents (g)
Before cooling	63
After cooling	63

ANSWER _____

_____

4 Use the bar graph. How much did each sealed sample's mass change?

MASS OF SEALED SAMPLES



ANSWER _____

_____

5 A sealed bag contains 41 g of flour and 22 g of water. What is the total mass of the flour and water after they are mixed?

ANSWER _____

6 A bag of trail mix contains 39 g of raisins and some nuts. The trail mix has a total mass of 91 g. How many grams of nuts are in the bag?

ANSWER _____

APPLY IT Show your work

1 At a class party, you mix 58 g of fruit with some yogurt in a sealed bottle. The fruit and yogurt have a total mass of 132 g after mixing. How many grams of yogurt did you add?

WORK SPACE

ANSWER _____

2 You make four ice pops in sealed pouches. Each pouch holds 28 g of juice. What is the total mass of the juice after it freezes?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Water is heated in a closed cup. Some water collects on the lid. Use the table to find the total mass before and after heating. Explain why the mass in the cup fell even though the total mass stayed the same.

MASS DURING HEATING

What was measured	Before (g)	After (g)
Cup and liquid	108	102
Water on lid	0	6

WORK SPACE AND ANSWER

ANSWER KEY

Where Did It Go?

GRADE 5 · 5-PS1-2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A sealed bag contains 24 g of sand and 31 g of small stones. What is the total mass of the sand and stones?	**55 g**
2	A closed container has a mass of 72 g after a sugar cube dissolves in water. What was the mass of the container and everything in it before the sugar dissolved?	**72 g**
3	Use the table. How many grams did the mass change as the jar cooled? Give one measurement as evidence.	**0 g. The jar and contents had a mass of 63 g both before and after cooling.**
4	Use the bar graph. How much did each sealed sample's mass change?	**Heated sample: 0 g. Cooled sample: 0 g.**
5	A sealed bag contains 41 g of flour and 22 g of water. What is the total mass of the flour and water after they are mixed?	**63 g**
6	A bag of trail mix contains 39 g of raisins and some nuts. The trail mix has a total mass of 91 g. How many grams of nuts are in the bag?	**52 g**

PART 2 · APPLY IT

1. **74 g of yogurt** Subtract the fruit's mass from the total: 132 g - 58 g = 74 g.
2. **112 g of juice** Freezing does not change the mass of juice in the sealed pouches. Multiply 4 × 28 g = 112 g.

CHALLENGE

The total mass was 108 g before and 108 g after heating. Six grams of water moved from the cup to the lid, so the mass of the cup and liquid fell while the total stayed the same.

Accept explanations that use equal before-and-after totals as evidence of conservation. For the challenge, students should count the water on the lid in the after total.