The Puffed Bag

Use observations and weight data to compare changes in matter.

P.5.5C "Students will demonstrate an understanding of the difference between physical and chemical changes. Analyze and communicate the results of chemical changes that result in the formation of new materials (e.g., decaying, burning, rusting…"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline changes that can be reversed, circle evidence that a new material formed, and connect matching weights in the table to help you compare the changes.

What Changed in Nia's Lab?

1. At the science table, Nia watches an ice cube melt into water. She can freeze that water to make ice again. This is a physical change: the material is still water, even though its state has changed. She also stirs dry sand into water. The sand can be separated with a filter and used again.

2. Next, Nia seals a bag with a small cup of vinegar and some baking soda kept apart inside. She tips the cup to mix them. Bubbles appear, and the bag puffs up. The bubbles are carbon dioxide gas, a new material made by the reaction. This chemical change cannot be undone by simply separating the materials.

3. Before each test, Nia weighs the sealed bag and everything inside it. She tips the cup, then weighs the still-sealed bag again. The table shows three tests with different amounts inside the bags. Even though each bag grows bigger, its total weight stays the same. The new gas has weight, and it remains trapped inside.

TOTAL WEIGHT OF SEALED BAG AND CONTENTS

Test	Before mixing (g)	After mixing (g)
1	105	105
2	112	112
3	98	98

2 ANSWER WITH EVIDENCE

Use the passage

1. Why is melting the ice cube a physical change?

2. What evidence shows that mixing the vinegar and baking soda caused a chemical change?

3. In test 2, how many grams were lost after mixing? What does this show about the total weight?

4. Why might the weights not match if Nia opened the bag before weighing it again?

3 YOUR TURN

Your own words

Write four sentences about heating a raw egg, melting an ice cube, and mixing two substances in a sealed jar. Explain which change makes new materials, which change can be reversed, and what happens to the total weight in the jar.

ANSWER KEY

The Puffed Bag

GRADE 5 · P.5.5C

PART 1 · READ AND MARK

Underline changes that can be reversed, circle evidence that a new material formed, and connect matching weights in the table to help you compare the changes. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why is melting the ice cube a physical change?	**It is still water, and freezing it can turn it back into ice.**
2	What evidence shows that mixing the vinegar and baking soda caused a chemical change?	**Bubbles of carbon dioxide gas appeared. The gas is a new material.**
3	In test 2, how many grams were lost after mixing? What does this show about the total weight?	**Zero grams were lost. The total weight stayed at 112 g.**
4	Why might the weights not match if Nia opened the bag before weighing it again?	**Some of the new gas could escape, so the bag and its remaining contents could weigh less.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Heating a raw egg makes new materials, so cooking it is a chemical change. I cannot turn the cooked egg back into a raw egg. A melting ice cube is a physical change because I can freeze the water into ice again. If I mix two substances in a sealed jar, the total weight will stay the same because nothing can escape.

For the open task, accept other accurate explanations that identify cooking as chemical, melting as reversible and physical, and equal total weight when a container remains sealed.