Mix, Measure, Notice

Use physical properties and mass to study mixtures.

4.6 "Matter and energy. The student knows that matter has measurable physical properties that determine how matter is identified, classified, changed, and used..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each detail that tells a physical property or shows what happened in a mixture. Number the two sentences that give the same total mass before and after mixing.

Maya's Mixture Tests

1. At the science table, Maya compared four objects before mixing anything. The metal washer had more mass than the plastic cap when each was placed on a balance. A magnet pulled the washer but not the cap. When placed in water, the cap floated and the washer sank. Both objects were solids. The water temperature was 20 degrees Celsius. Temperature, mass, magnetism, floating, and state are observable physical properties.

2. Next, Maya stirred sand into water. The sand did not dissolve, and it settled after the cup rested. This mixture could be separated with a filter. In another cup, she stirred salt into water. The salt dissolved and spread evenly, making a solution. A solution is a mixture. Later, she mixed vinegar and water, two liquids that also formed a solution.

3. Finally, Maya poured 100 grams of soil and 100 grams of water into a covered jar. The total mass was 200 grams before mixing and 200 grams afterward. The soil settled, so the mixture looked different, but no matter disappeared. In a second covered jar, oil and water formed layers because oil floated. Their total mass also stayed the same. Mixing can change how materials are arranged without changing the amount of matter.

2 ANSWER WITH EVIDENCE

Use the passage

1. What two observations show that the washer and cap have different physical properties?

2. How does the passage show that salt water is a solution?

3. Compare sand and water with salt and water. What happened to each solid in water?

4. How do the masses in the soil-and-water jar show that matter was conserved?

3 YOUR TURN

Your own words

Plan three covered-container mixture trials. In each trial, mix 100 grams of water with 20 grams of a material. Use at least one solid and one liquid, then predict what you will observe, describe the mixture, and compare the total mass before and after mixing.

MATERIAL AND STATE	PREDICTION IN WATER	MIXTURE DESCRIPTION	MASS COMPARISON

ANSWER KEY # Mix, Measure, Notice

GRADE 4 · TEKS 4.6

PART 1 · READ AND MARK

Underline each detail that tells a physical property or shows what happened in a mixture. Number the two sentences that give the same total mass before and after mixing. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What two observations show that the washer and cap have different physical properties?	**Answers may include: the washer had more mass, the magnet pulled the washer but not the cap, or the cap floated while the washer sank.**
2	How does the passage show that salt water is a solution?	**The salt dissolved and spread evenly through the water.**
3	Compare sand and water with salt and water. What happened to each solid in water?	**Sand did not dissolve and settled. Salt dissolved and spread evenly.**
4	How do the masses in the soil-and-water jar show that matter was conserved?	**The total mass was 200 grams before mixing and 200 grams after mixing.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

MATERIAL AND STATE	PREDICTION IN WATER	MIXTURE DESCRIPTION	MASS COMPARISON
Sugar, solid	Dissolves and spreads evenly	Solution, solid in liquid	120 g before and 120 g after
Vegetable oil, liquid	Floats in a layer	Mixture, liquid in liquid	120 g before and 120 g after
Pebbles, solid	Sink to the bottom	Mixture, solid in liquid	120 g before and 120 g after

Accept any two accurate differences for Question 1. For the open task, accept reasonable predictions and descriptions when the student includes one solid, one liquid, and a total mass of 120 grams before and after each covered trial.