TEACHER KEY · LESSON WORKSHEET · GRADE 5 · 5-PS1-1-5-PS1-4

Properties of Matter & Conservation of Mass

Fill in each part when its number appears on the slide.

PART 1 · TARGET

I can measure and describe properties of matter and explain why mass stays the same when matter changes.

PART 2 · WARM-UP

1. List three properties you could use to describe a rubber ball.
   Key: Any three: color, shape, size, texture, bounciness (elasticity), mass, volume, hardness.
2. A backpack has a mass of 3 kg. You put a 1 kg book inside. What is the total mass? Explain how you know.
   Key: 4 kg. Masses add: 3 kg + 1 kg = 4 kg. Nothing was taken away.
3. Predict: If you melt a 50 g ice cube in a sealed bag, will the water weigh more, less, or the same? Why?
   Key: The same, 50 g. No matter entered or left the sealed bag; the water just changed state.

PART 3 · PREDICTION

A 50-gram ice cube melts inside a sealed bag. What will the water weigh?

Circle one: [ ] More than 50 g [ ] Exactly 50 g [ ] Less than 50 g

PART 4 · VOCABULARY

Word	Meaning
Matter	Anything that has mass and takes up space.
Mass	The amount of matter in an object, measured in grams (g).
Volume	The amount of space something takes up, measured in mL or cm^3.
Physical change	A change in size, shape, or state that makes no new substance.

PART 5 · MATTER HAS PROPERTIES

Matter is anything that has MASS and takes up SPACE. We can test properties like magnetism, conductivity, and SOLUBILITY.

Check: Which property tells if a substance dissolves in water?

Circle one: (A) Conductivity (B) Hardness (C) Solubility (D) Magnetism

Key: (C) Solubility. Solubility means how well a substance dissolves.

PART 6 · MEASURE MASS AND VOLUME

Mass is measured in GRAMS with a BALANCE. Liquid volume is measured in MILLILITERS with a graduated cylinder.

Check: What is the volume of the box shown in the tool? (cubic centimeters)

Answer: _____ cm^3

Key: 12 cm^3. 3 × 2 × 2 = 12 cm^3.

PART 7 · PHYSICAL VS. CHEMICAL CHANGE

A PHYSICAL change makes no new substance. A CHEMICAL change makes a new substance. Clues include gas BUBBLES and a new color.

Check: Baking soda and vinegar fizz. Which kind of change is it?

Circle one: (A) Physical, because it is a liquid (B) Physical, because it can be undone (C) Neither (D) Chemical, because a new gas forms

Key: (D) Chemical, because a new gas forms. Bubbles you did not add mean a new gas formed.

PART 8 · CONSERVATION OF MASS

In a CLOSED system, the mass before a change EQUALS the mass after. If a gas escapes, the scale reading goes DOWN.

Check: Sealed flask: 200 g before fizzing. What does it weigh after?

Circle one: (A) Less than 200 g (B) More than 200 g (C) 0 g (D) 200 g

Key: (D) 200 g. Nothing escaped the sealed flask, so the mass stays 200 g.

PART 9 · WORKED EXAMPLE

1. Problem: 30 g of water + 5 g of salt are stirred together. The salt seems to disappear. What is the total mass?
2. Step 1: The salt particles did not vanish. They spread out through the water.
3. Step 2: Nothing left the cup, and nothing was added.
4. Step 3: 30 g + 5 g = 35 g.
5. Answer: 35 g. Mass is conserved.

PART 10 · WE DO

A sealed bag holds 40 g of vinegar and 5 g of baking soda. They fizz and the bag puffs up. What does the bag weigh now?

Answer: 45 g

PART 11 · YOU DO

An OPEN cup holds 150 g of water and a 10 g antacid tablet. After fizzing, the scale reads 157 g. What happened to the other 3 g?

Circle one: (A) The scale is broken (B) It turned into water (C) It escaped into the air as a gas (D) It was destroyed

Key: (C) It escaped into the air as a gas. 160 g - 157 g = 3 g of gas escaped the open cup. Matter is conserved.

PART 12 · WORK TIME: MUSEUM OF MARVELOUS MATTER

Write each code piece as you earn it: Exhibit A: A Exhibit B: T Exhibit C: O Exhibit D: M Exhibit E: S

Final code: ATOMS

PART 13 · WRAP-UP

Was your prediction in Part 3 right? One thing I learned today:

Key: The same, 50 g. No matter entered or left the sealed bag; the water just changed state.