

FOR THE EDUCATOR

Teacher Answer Key

Organized by day and activity. Every numbered question is matched with its expected answer for quick classroom reference.

What Is Matter? Atoms, Elements & Compounds

PRACTICE QUESTIONS

Q1 Define matter in your own words.

A. Matter is anything that has mass and takes up space.

Q2 What is the difference between an element and a compound?

A. An element is made of only one kind of atom (like oxygen). A compound is two or more different atoms bonded together (like water).

Q3 Water is written as H_2O . What does the small number 2 mean?

A. It means two hydrogen atoms are bonded to one oxygen atom in each water molecule.

Q4 Give the symbols for gold, iron, and sodium.

A. Au, Fe, and Na.

Q5 Why do compounds usually behave differently than the elements that made them?

A. Because bonding changes the way the atoms interact with the world — the new compound has its own set of properties, not just a blend of the old ones.

States of Matter: Solid, Liquid, Gas

PRACTICE QUESTIONS

Q1 In which state are particles packed tightly and only vibrate in place?

A. Solid.

Q2 What happens to the particles in a liquid when you add heat?

A. They gain energy and move faster, spreading further apart. Enough heat causes them to escape as a gas (evaporation).

Q3 What is the change from a gas back to a liquid called?

A. Condensation.

Q4 A puddle disappears on a sunny day. Which change of state has happened, and where did the water go?

A. Evaporation. The liquid water became water vapor (a gas) in the air.

Q5 Draw and label the particle arrangement for a solid, a liquid, and a gas.

A. Solid = tightly packed grid, small vibration arrows. Liquid = loosely packed, curved motion arrows. Gas = far apart, long motion arrows in all directions.

Physical vs. Chemical Change — Balloon Rocket Lab

PRACTICE QUESTIONS

Q1 Give one example of a physical change and explain why it is physical.

A. Melting an ice cube. The water changed state but is still water — no new substance was created.

Q2 Give one example of a chemical change and one piece of evidence.

A. Rusting iron. A new orange substance (iron oxide) forms that isn't iron anymore — color change and a solid coating are evidence.

Q3 In the balloon lab, what filled the balloon and where did it come from?

A. Carbon dioxide gas came from the chemical reaction between baking soda and vinegar.

Q4 Name three pieces of evidence that a chemical reaction has happened.

A. Any three of: bubbles/gas, color change, temperature change, light or sound, new smell.

Q5 Write the word equation for the balloon lab reaction.

A. Baking soda + vinegar → water + sodium acetate + carbon dioxide.