

Bubble Evidence Lab

Use observations and comparisons to investigate chemical changes.

5-PS1-4 "Conduct an investigation to determine whether the mixing of two or more substances results in new substances."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each observation that suggests a new substance formed. Circle the sentences that explain how the class made the investigation fair or identified a product.

A Cup That Changed

- ① A class investigated what happens when baking soda and vinegar are mixed. They placed two spoonfuls of baking soda in a clear cup, then slowly poured in vinegar. Before mixing, they recorded the color, temperature, and state of each substance. They also set up a comparison cup containing only vinegar. Keeping the same amounts and tools made the test fair.
- ② When the vinegar touched the baking soda, bubbles rose quickly and the cup felt cooler. A balloon stretched over the cup filled with gas. The class observed that neither starting substance was a gas. The comparison cup did not bubble or fill a balloon. These observations suggested that mixing caused a change that was more than a simple change in shape or size.
- ③ To decide whether new substances formed, the class looked for properties different from those of the starting materials. They collected some gas in a second balloon and bubbled it through limewater. The limewater turned cloudy, which is a known result when carbon dioxide is present. Carbon dioxide has different properties from baking soda and vinegar. The reaction also made water and dissolved sodium acetate. A substance can change into new substances when it seems to disappear.

2 ANSWER WITH EVIDENCE Use the passage

1 What three properties did the class record before mixing the substances?

2 Why did the class use a comparison cup containing only vinegar?

3 What two observations showed that a gas formed during the investigation?

4 What claim should the class make about mixing baking soda and vinegar? Use evidence from the passage.

3 YOUR TURN Your own words

Design an investigation using yeast, warm water, and sugar. Write three numbered steps that include a comparison, something you will measure or observe, and a claim about whether new substances formed.

PART 1 • READ AND MARK

Underline each observation that suggests a new substance formed. Circle the sentences that explain how the class made the investigation fair or identified a product. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What three properties did the class record before mixing the substances?	They recorded color, temperature, and state of matter.
2	Why did the class use a comparison cup containing only vinegar?	It showed that vinegar alone did not bubble or fill a balloon, so those changes happened when the substances were mixed.
3	What two observations showed that a gas formed during the investigation?	Bubbles rose, and the balloon over the cup filled with gas. The starting substances were not gases.
4	What claim should the class make about mixing baking soda and vinegar? Use evidence from the passage.	New substances formed. Evidence includes the carbon dioxide identified by cloudy limewater, plus water and dissolved sodium acetate.

PART 3 • YOUR TURN (SAMPLE ANSWER)

1. Put equal amounts of warm water and yeast into two bottles, add sugar to Bottle A but not Bottle B, and stretch balloons over both bottles. 2. Keep both bottles in the same place for 20 minutes, then measure each balloon's circumference and record any temperature change. 3. If Bottle A makes a larger balloon than Bottle B, I would claim that mixing yeast, water, and sugar formed a gas, which is a new substance.

Accept evidence-based claims that connect a different property or product, such as gas, temperature change, color change, or a solid, to the formation of new substances. For the open task, accept other safe, workable investigations if they include a comparison, controlled conditions, observations, and a supported claim.