DID A CHEMICAL REACTION HAPPEN?

Using before-and-after evidence like a scientist



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What Changes? What Stays?

Scientists compare properties before and after to spot something brand-new.

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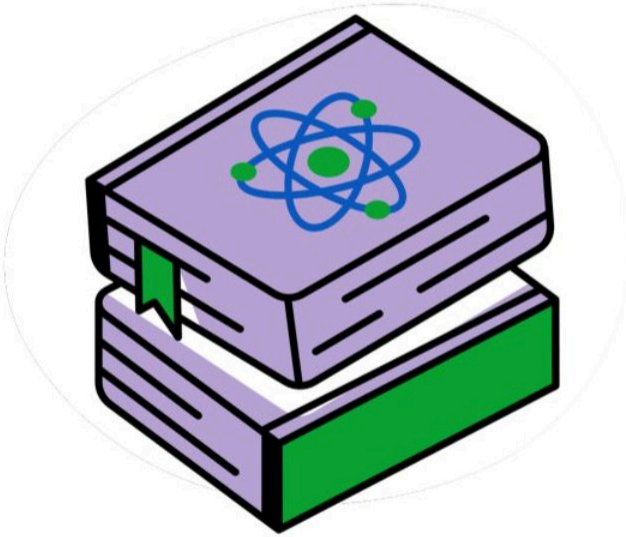
SAME SUBSTANCE OR NEW SUBSTANCE?



No Reaction: Same Substance

- Melting ice still looks and feels like water.
- Dissolving tea spreads color but tea stays tea.

Reaction: New Substance

- Bubbles of new gas that do not turn back.
- Unexpected color or solid with new properties.

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HOW TO DECIDE: DID IT REACT?

1. Record color, state, smell, and temperature first.
2. Mix substances and watch closely for changes.
3. Record color, state, smell, and temperature after.
4. Compare data: new properties mean a reaction.



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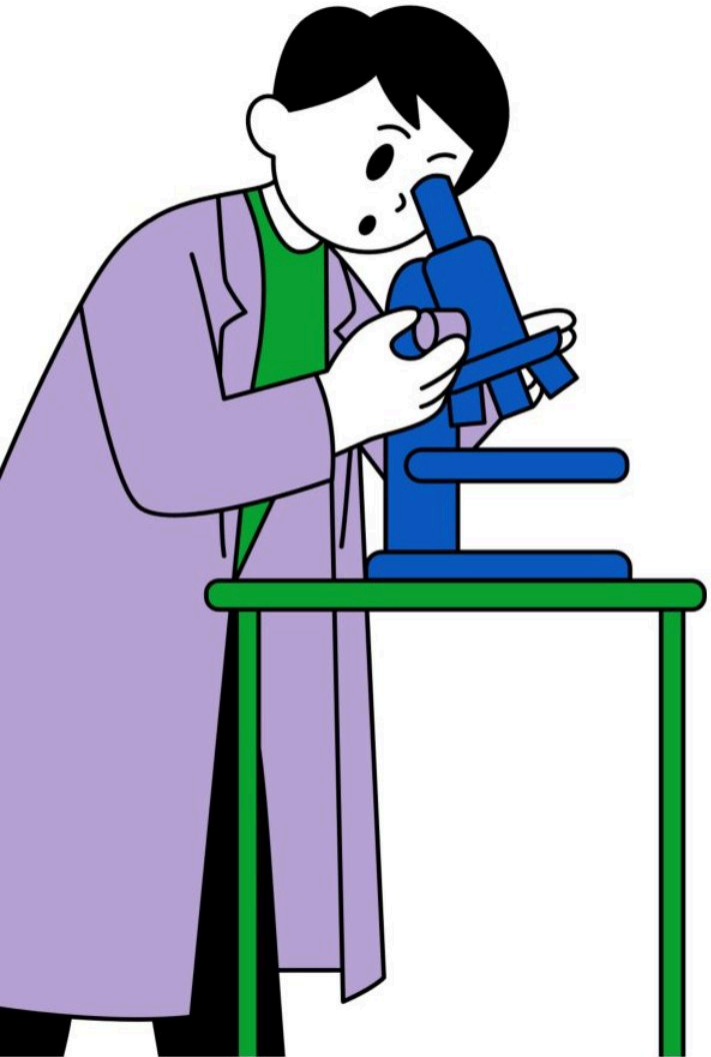

THINK, PAIR, SHARE

Toast turns brown and crunchy. Could you turn it back to soft white bread? What does that tell you?



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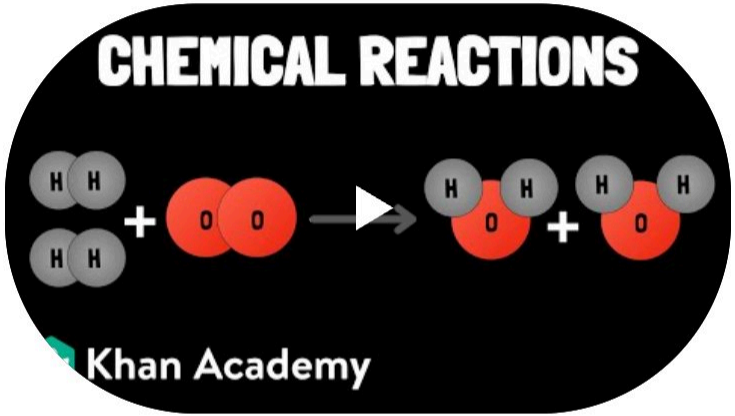
WATCH: BEFORE AND AFTER

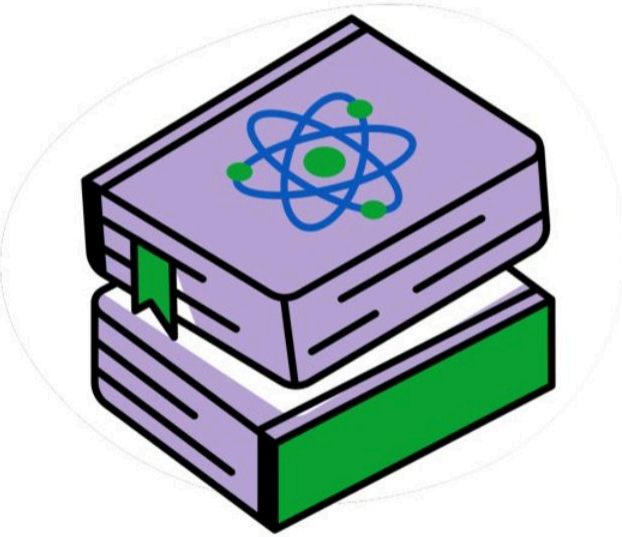


▶ 0:00 – 4:21

- Track each substance's properties before mixing.
- Name what evidence shows something new formed.



KEY WORDS



reactant

substance present before a reaction happens

product

new substance made after a reaction

property

what you observe, like color or state

precipitate

a new solid that forms in liquid

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WATCH: CLUES IN ACTION



▶ 0:00 – 4:50

- Spot color change, bubbles, or heat change.
- Decide: new substance or just mixed?



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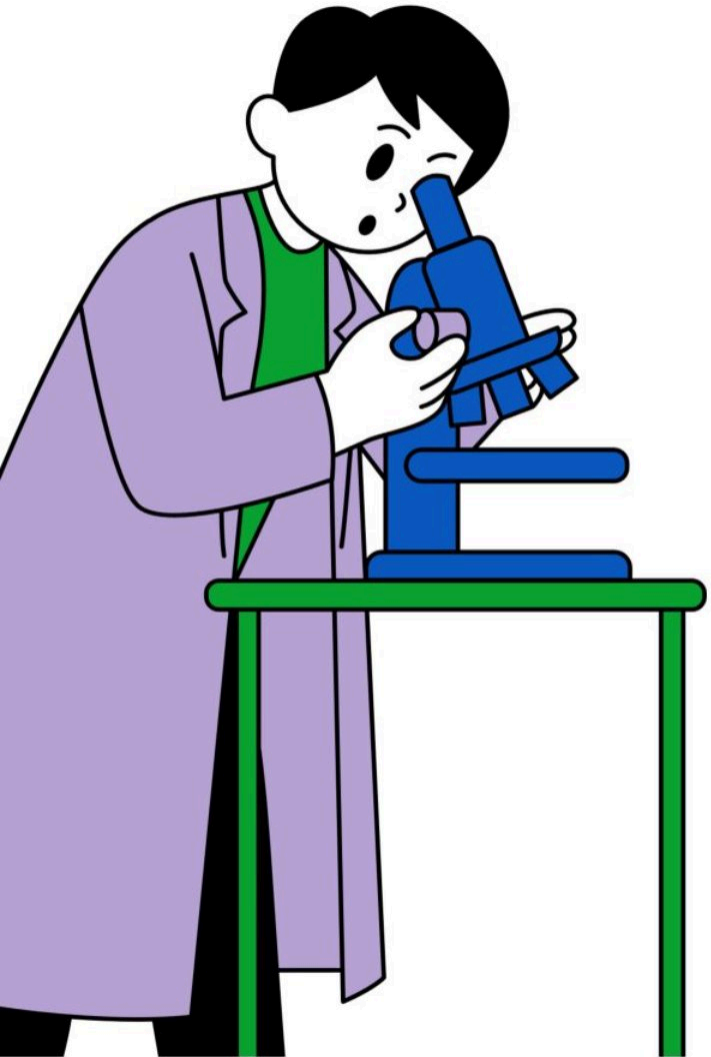

YOUR TASK

In pairs, use before-and-after data to decide: reaction or not? Justify with evidence.

1. A: Clear liquids mix -> yellow solid appears in liquid.
2. B: Ice melts -> still clear, odorless liquid.
3. C: Powders mix, fizz, get warm -> new gas forms.
4. Label each R or NR and name the clue.

10 min

In pairs

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4 CLUES A REACTION HAPPENED



🎨

Color Change

A brand-new color appears that was not there before.

🫧

Gas Bubbles

Fizzing makes a new gas you cannot easily reverse.

🌡️

Temperature Shift

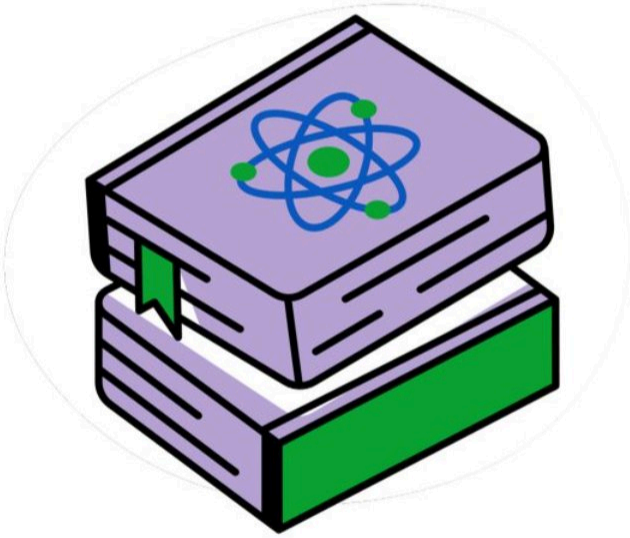
Mixture gets hot or cold without heating or cooling.

🧱

New Solid

A cloudy solid forms when two clear liquids mix.

WHAT COULD THIS BE?



This kettle bubbles hard when hot. Is the bubbling gas a new substance from a reaction?



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TRUE OR FALSE?

If atoms rearrange to make a new substance, it is a chemical reaction.

Bubbles in boiling water always prove a chemical reaction happened.

Comparing properties before and after helps decide if a reaction occurred.

Dissolving tea in hot water creates a brand-new substance.



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