

Evidence of New Substances

Bubble Reactor Hall with Fizzling

Learning target

Use more than one observation to evaluate a chemical-change claim.



Before you begin

Use the reference page and discussion prompts on their own, or open the optional browser adventure. No earlier lesson or physical kit is required.

For online play: use an internet-connected current browser with local storage enabled. Read the three-part Gemling briefing, answer the quick check, and apply the evidence at three checkpoints. Retry feedback supports review; results are not a secure test or gradebook.

Use for teacher-led review, science centers or partner practice. Independent readers may need support with the vocabulary below. The design target is grades 3-5; choose support based on the learner.

Vocabulary and concepts to discuss

Gas formation; precipitates; energy changes; observations versus conclusions

Open Bubble Reactor Hall - direct lesson link

Scan the QR code or use the clickable link. This guide is usable offline; the adventure runs on an external educational website.



Evidence of New Substances - key ideas

1. The first clues

Bubbles can signal gas formation during a reaction, but bubbles also occur when water boils. One observation alone may have several explanations.

2. How the clues connect

A new solid forming from solutions, gas production and energy changes can contribute evidence. Compare the starting materials, conditions and products.

3. Our evidence record

Our records show boiling water producing water vapor and a separate documented reaction producing a different gas. Both bubble, but the substance evidence distinguishes them.

Keep the science accurate

No equations, bonding, acids/bases course or catalyst mechanism required. A single color change or bubbles alone is not proof.

Apply the evidence

Use a specific observation from this lesson to explain one choice. Point to a clue, then connect that clue to a scientific idea.

Curriculum reference: <https://www.nextgenscience.org/dci-arrangement/5-ps1-matter-and-its-interactions>

Talk through the evidence

1. Do bubbles alone prove chemical change?

Expected answer: No

Reasoning: Bubbles can signal gas formation during a reaction, but bubbles also occur when water boils. One observation alone may have several explanations.

2. What gas comes from boiling water in this model?

Expected answer: Water vapor

Reasoning: Our records show boiling water producing water vapor and a separate documented reaction producing a different gas. Both bubble, but the substance evidence distinguishes them.

3. What additional evidence helps?

Expected answer: The identities of materials before and after

Reasoning: A new solid forming from solutions, gas production and energy changes can contribute evidence. Compare the starting materials, conditions and products.

4. Why compare the two records?

Expected answer: Similar observations can have different explanations

Reasoning: Bubbles can signal gas formation during a reaction, but bubbles also occur when water boils. One observation alone may have several explanations.

Guide the discussion

Ask learners to name the evidence that supports their answer. If an answer differs, revisit the matching key idea on page 2 and invite a revised explanation.

Online rewards: this lesson grants one fixed digital Expedition Discovery. Five saved digital Gemling friends become available only after all six distinct subject lessons are complete, in any order. Digital rewards do not establish physical ownership.