Gas tests: procedure and evidence

Student activity • evidence and review

YEAR 10 / LESSON 34 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

The question

What observation supports the identity of an unknown gas?

Build a five-gas identification guide from reference evidence. Distinguish a lighted splint from a glowing splint and a colour change from bleaching. This is a classroom evidence task; no gas is prepared or ignited.

Equipment

- Booklet and pencil
- Five reference statements in the evidence section
- Optional teacher-selected recording of the tests; no gas samples

Desk activity only. Do not smell, prepare, mix or ignite gases. Any optional video depicts a separate controlled demonstration.

Course coverage: 2.44: describe tests for hydrogen, oxygen, carbon dioxide, ammonia and chlorine.

Plan, model or apparatus sketch

Compare a lighted splint with a glowing splint.

Method and reasoning

Read the whole sequence before starting

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1. Read the five reference statements without assigning results to any real classroom sample. Label them “supplied reference evidence”.

2. Draw a lighted splint and a glowing splint. Label the visible flame on the first and the glowing tip without flame on the second.

3. Complete the five-row guide with the test procedure and positive observation, then cover the reference text and retrieve the results from memory.

4. Explain why damp paper is needed for ammonia and chlorine tests. Keep red-to-blue separate from coloured-to-white bleaching.

5. Classify these statements: “extinguishes a flame”, “relights a glowing splint”, and “turns limewater cloudy”. Decide which provides the expected positive test among these five gases.

6. If a recording is used, identify its source and record what you actually see separately from the reference statements. Leave the observation entry blank if no recording is shown.

7. Write a procedure-and-observation answer for one unknown gas, then exchange and check it for precise reagent names and outcomes.

Cleanup

- Keep the corrected guide; return cards and recycle paper.

Record your evidence

Blank spaces are for your own work

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Reference and task data

Reference evidence: hydrogen gives a squeaky pop with a lighted splint at the mouth of a small gas sample; oxygen relights a glowing splint; carbon dioxide makes limewater cloudy; ammonia turns damp red litmus blue; chlorine bleaches damp litmus white (damp blue litmus may first turn red). These are supplied results, not observations made in this lesson.

Gas	Test procedure	Positive observation
H_2		
O_2		
CO_2		
NH_3		
Cl_2		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Describe the hydrogen test, including the splint condition and location.

2. Explain how the oxygen test differs from the hydrogen test.

3. Describe the carbon dioxide test and explain why “the flame goes out” is insufficient.

4. Describe the ammonia test without using smell.

5. Describe chlorine’s effect on damp litmus and distinguish bleaching from an alkaline colour change.

6. Explain why a positive water-based indicator test needs damp paper and identify one limitation of reference-only evidence.