Atmosphere and inorganic reactions: evidence review

Student activity • observation and reasoning

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The question

Can you justify an answer with evidence rather than a memorised phrase?

Combine gas-volume reasoning, greenhouse physics, combustion equations and thermal decomposition in original review tasks. Correct one misconception in each topic.

Equipment

• Booklet, calculator, periodic table and previous lesson notes

Written review only. A method question is not an instruction to use laboratory apparatus.

Course coverage: Shared-core review of 2.9–2.14. Original practice tasks, not reproduced examination questions.

Plan, model or apparatus sketch

Draw and label the model or apparatus that explains the central idea of this lesson.

Method and reasoning

Read the whole sequence before starting

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1. Recall the approximate proportions of dry air before checking your notes. Explain why water vapour is not assigned one fixed percentage.

2. Use the invented rusting dataset 90.0 cm^3 initially and 71.2 cm^3 after a stable reading. Calculate the removed fraction and state the experimental assumptions.

3. Draw shortwave incoming and longwave outgoing radiation. Explain greenhouse-gas absorption/emission without drawing a sealed lid.

4. Balance $Mg + O_2 \rightarrow MgO$ and $H_2 + O_2 \rightarrow H_2O$. Explain the oxygen-gain definition of oxidation.

5. Explain green-to-black solid and cloudy limewater in a copper-carbonate heating example. Put the shutdown steps in their safe order.

6. Check your answers with the teacher, correct the reasoning in a different colour and write one specific revision action.

Cleanup

- Keep corrected answers and return shared resources.

Record your evidence

Blank spaces are for your own work

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Reference and task data

Invented practice data, not class results: trapped gas 90.0 → 71.2 cm³. Removed fraction=(initial−final)/initial. Approximate dry air: 78% nitrogen, 21% oxygen, about 0.9% argon with trace gases. State comparable temperature/pressure and complete oxygen removal when interpreting rusting.

Topic	My evidence / working	Correction / next step
Air calculation		
Greenhouse explanation		
Reaction equations		
Decomposition method		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Calculate the percentage removed from the invented gas sample.

2. Give two limitations of interpreting that result as oxygen percentage.

3. Explain the difference between natural and enhanced greenhouse effects.

4. Balance the magnesium and hydrogen combustion equations.

5. Name the products in the simplified $CuCO_3$ decomposition equation.

6. Correct: remove the flame first, then remove the delivery tube from limewater.