

Atmospheric Chemistry and Climate-Model Evidence

Student Worksheet | g10_u08_w32

I can: distinguish a supplied measurement from a model output, identify a printed assumption, and make a bounded atmospheric-chemistry claim.

Scope card: This is a paper data-model exercise using fictional values. The observation column is a supplied measurement index; the two response columns are calculated outputs from idealized model configurations. The cards support comparisons only. They do *not* forecast weather, identify a real location, establish a health effect, recommend policy or personal action, or prove that every omitted process is unimportant.

printed input level	measured gas-index value	model F response index	model V response index
2	2.0	0.40	0.30
4	2.5	0.70	0.50
6	3.0	1.00	0.70

Model card: F holds the printed background parameter fixed. V allows that parameter to vary by a stated rule. Both treat a single idealized atmospheric box and use a simplified molecular absorption-response relationship. The table gives no real date, place, weather variables, health data, or decision criteria.

1. Which column contains supplied measured values?

2. Which two columns contain model outputs?

3. State one printed assumption or boundary of model F.

4. State one printed assumption or boundary of model V.

5. What is the measured gas-index increase from input level 2 to 4?

6. What is the measured gas-index increase from input level 4 to 6?

7. What is the total measured gas-index increase from input level 2 to 6?

8. What is the F response-index increase from input level 2 to 4?

9. What is the F response-index increase from input level 4 to 6?

10. What is the V response-index increase from input level 2 to 6?

11. At input level 6, calculate F minus V.

12. At which printed input level is the F–V difference largest?

13. Write one directly supported statement comparing F and V at input level 4.

14. What molecular-chemistry idea is named in the model card as part of the simplified relationship?

15. Why does a calculated F or V value not become a measured observation merely because it is printed in a table?

16. State two missing categories of evidence before a claim about a real place or time could be evaluated.

17. Critique: "Because F is higher than V at level 6, tomorrow's weather is known."
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18. Critique: "The model card proves a policy, health, or personal-action conclusion."
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19. Write a claim that correctly separates one measurement-index comparison from one model-output comparison.
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20. Write a cautious CER: make a claim about the printed F/V difference, cite two values, reason from an assumption, and state a model/real-world boundary.
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