

Final Chemistry Synthesis and Capstone Transfer

Student Worksheet | g10_u09_w36

I can: select an appropriate model, audit a claim, and reflect on evidence-based reasoning without personal disclosure.

Scope card: All case cards and response excerpts are fictional paper models. Reflection means citing a printed calculation, model boundary, or claim revision; it does not ask for personal history, identity, feelings, grades, or disclosure. Nothing here is an experiment, safety assessment, policy/health recommendation, or real-world prediction.

fictional case card	supplied evidence and boundary
ratio	$3A \rightarrow 2B$; 0.90 mol A on an equation card
energy	$\Delta H = -30$ kJ per stated reaction amount
rate	fixed condition G: $[A]$ 0.20 to 0.40 M; rate 5.0 to 10.0 units
equilibrium	stated model mixture: $Q = 0.25$, $K = 1.0$
acid-base	pH 5.00; use $[H_3O^+] = 10^{-pH}$
electrochemistry	cathode +0.60 V; anode -0.10 V

Fictional response excerpts: E1: "Q<K, so the system reaches equilibrium quickly." E2: "pH 5.00 gives hydronium concentration but not every solute identity." E3: "A positive potential proves a real product is safe." Audit the printed reasoning, not a person.

1. Which model card supplies a mole ratio?

2. Calculate the equation-model amount of B from 0.90 mol A.

3. What calculation boundary should accompany the result in item 2?

4. Is the energy card endothermic or exothermic? Explain from the sign.

5. Calculate the energy value assigned to twice the stated reaction amount.

6. By what factor does $[A]$ change in the rate card?

7. By what factor does the printed rate change?

8. Write the narrowest rate statement for condition G.

9. Compare Q and K in the equilibrium card.

10. What net-direction label does the model assign for this Q/K comparison?

11. Audit E1: what part is supported, and what part overreaches?

12. Calculate $[H_3O^+]$ from pH 5.00.

13. Audit E2: why is it a stronger bounded statement?

14. Calculate $E_{\text{cell}}^{\circ} = E_{\text{cathode}}^{\circ} - E_{\text{anode}}^{\circ}$.

15. Audit E3 using the electrochemistry boundary.

16. Name one printed calculation or model comparison you could cite in an evidence-based reflection.

17. Write an evidence-based strategy statement: name one card, the calculation/comparison it supports, and a limit. Do not include personal information.

18. Revise the fictional overclaim "All cards together predict a real outcome" into a bounded statement using two cards.

19. Critique: "A correct calculation makes uncertainty, assumptions, and evidence quality unnecessary."

20. Write a final capstone CER: synthesize two printed cards, cite values, explain why each model applies, and state two explicit limits. Do not make a personal, high-stakes, health, policy, or action claim.
