

Grade 11 Midyear Chemistry Exam

Units 1–4: quantities, energy, kinetics, equilibrium

All contexts are original fictional paper models. No laboratory work, chemical handling, device operation, intervention, recommendation, or real-world decision is requested. Total points: 41.

1. Calculate the mean of 12.1, 12.4, and 12.2 units; state a sensible reported value. [3 pts]

2. Calculate their range and state one limit of the mean. [3 pts]

3. A card gives 2.50 ± 0.05 g and 1.00 ± 0.02 mL. Calculate density. [3 pts]

4. Estimate relative uncertainty and absolute density uncertainty. [3 pts]

5. A reaction card has $\Delta H = -40$ kJ. Interpret sign and system-energy direction. [3 pts]

6. Explain why bond breaking requires energy even when a full reaction is exothermic. [3 pts]

7. A rate card doubles concentration and doubles initial response. State a bounded conclusion and excluded claim. [3 pts]

8. A high-barrier card labels a lower final state. Explain rate versus energy distinction. [3 pts]

9. A reversible card has equal forward/reverse rates. Explain dynamic equilibrium and whether amounts must be equal. [4 pts]

10. A model has $Q < K$. State favored direction and a limitation of the comparison. [4 pts]

11. A source says its equilibrium model proves a product should be used. Identify two evidence/authority limits. [4 pts]

12. Write a CER synthesis connecting a quantity card, an energy/rate card, and equilibrium card with uncertainty/boundary and no recommendation. [5 pts]
