

Grade 12 Chemistry Start Diagnostic

Molecular models, quantities, and evidence readiness

This internal diagnostic guides instruction; it is not a grade, placement, proficiency, or release claim. All cards are fictional paper models. A calculator is optional.

Name: _____ **Date:** _____ **Directions.** Select the best answer where choices are given. Show units and reasoning. Eight items total 16 points.

1. A structure card labels a carbonyl group $C = O$. Which statement is safest? [1 pts]

A. It identifies a functional-group feature.
B. It proves a complete molecular identity.
C. It proves a reaction mechanism.
D. It proves a real product is safe.

2. A fictional card gives mass 2.50 ± 0.05 g and volume 1.00 ± 0.02 mL. Calculate central density. [2 pts]

3. Estimate relative uncertainty by adding relative uncertainties, then state density with approximate absolute uncertainty. [2 pts]

4. A model labels a lower final energy state and a high activation barrier. Explain why this can describe a slow change. [2 pts]

5. A reversible-model card says forward and reverse rates are equal. Does that require equal amounts? Explain. [2 pts]

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6. A table lists $Y = 4.0, 5.1, 5.8$ units at labeled $X = 1, 2, 3$, each with ± 0.2 units. Calculate the total Y change and average change per X step. [2 pts]
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7. A source claims its fictional X - Y pattern proves X causes Y everywhere. Identify two limits or missing evidence types. [2 pts]
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8. Write a two-sentence bounded conclusion using the table in item 6. Include its uncertainty and one excluded claim. [3 pts]
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Instructor use: use the item map for targeted Grade 12 reteach; do not use this single check for placement or release decisions.