

Percent Composition: Competition Corner

Week 27 | Explain, calculate, defend

Competition Corner

Use classroom calculation values from `audits/atomic_masses_v2024.1.json`, derived from CIAAW/IUPAC Standard Atomic Weights 2024 (accessed 2026-07-26). Give units and a defensible comparison.

1. Carbon comparison. Which has the larger carbon mass fraction: CO_2 or CaCO_3 ? Calculate both, then explain why the formula with three oxygens can still have the lower carbon percent.

2. Hydrate detective. A provided data card reports that a 5.000 g crystal contains 3.196 g anhydrous CuSO_4 . Calculate experimental percent water. Compare with the theoretical percent water in $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ and decide whether the label is supported.

3. Design constraint. A mixture contains only pure MgO and NaCl . Its measured Mg percentage is 30.15%. What mass percent of the mixture is MgO ? Show why a percent composition can be used as a composition signal.