

# Chemical Equations: Competition Corner

Week 29 | Balance, model, and test the system boundary

## Competition Corner

Equation conventions: IUPAC Gold Book, *chemical reaction equation* and *stoichiometric number*; see `sources.md`. These are data/model prompts only: do not perform a reaction.

**1. Strategy defense.** Balance  $\text{C}_2\text{H}_6 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ . Explain why balancing C and H before O makes the work easier, and give a final atom inventory.

**2. Boundary detective.** A closed flask reads 52.436 g before and 52.436 g after a reaction card. A second group records 52.436 g before and 51.991 g after in an open beaker. Calculate the second group's difference and write a claim that separates conservation from what the balance measured.

**3. Error analysis.** A learner changes  $\text{Al}_2\text{O}_3$  to  $\text{AlO}$  while balancing aluminum and oxygen. Explain two reasons this is invalid, then write the correctly balanced equation using the original formula.