

Curiosity: Why can the same formula lead to different structures?

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A molecular formula counts atoms but does not always reveal how those atoms are connected. $\text{C}_3\text{H}_8\text{O}$ can be arranged with an alcohol pattern or with a different oxygen-containing connectivity. Condensed structural formulas add evidence about the order of atom groups, which is why they are useful for introductory classification.

They are still models with limits. A written formula is not a complete three-dimensional image and does not by itself tell us what a substance does in every condition. Good chemical language separates the structural signal shown on the card from claims that would require additional evidence.