

CHEMISTRY FUNDAMENTALS

Small Whole Number Ratios

Exploring the Law of Multiple Proportions



Dalton's Law, 1803

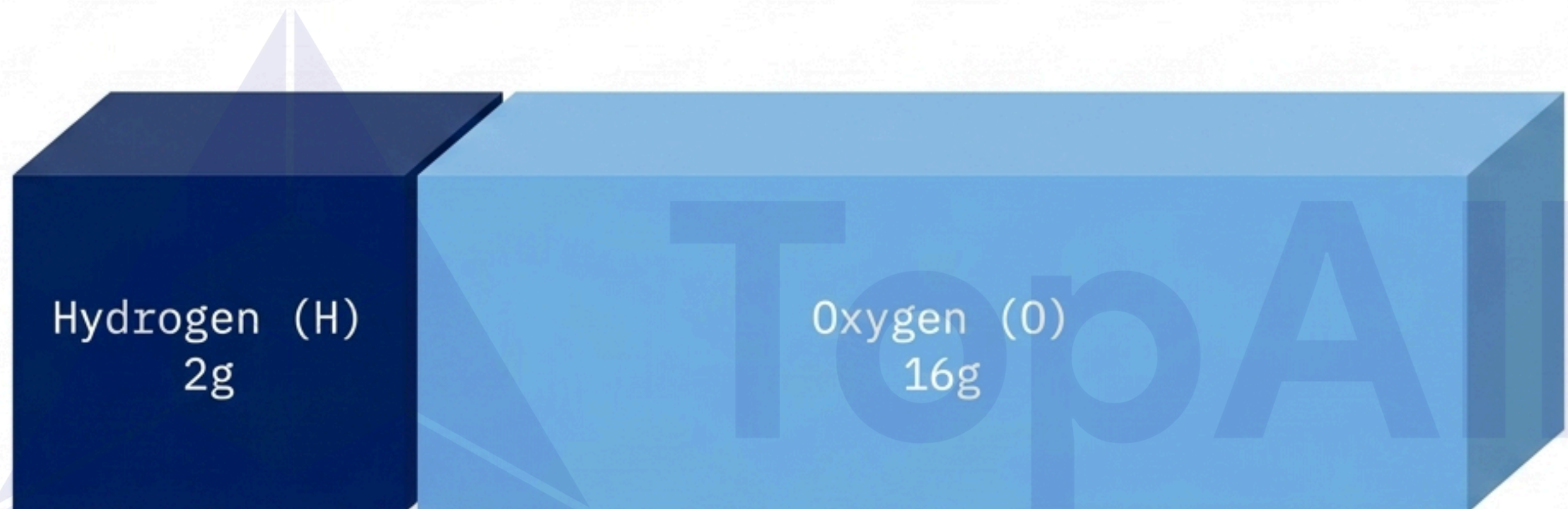
Proposed by John Dalton, this law explains the mathematical predictability of how atoms combine to form different compounds.

Elements combine to form >1 compound.

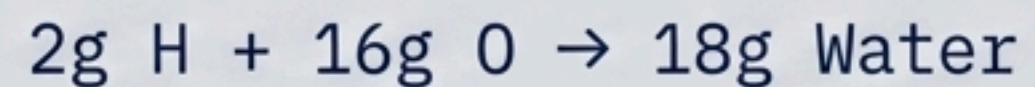
Keep the mass of one element ***fixed***.

The masses of the second element will form a ratio of small whole numbers.

Compound 1: Water (H₂O)



Total Mass: 18g





You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



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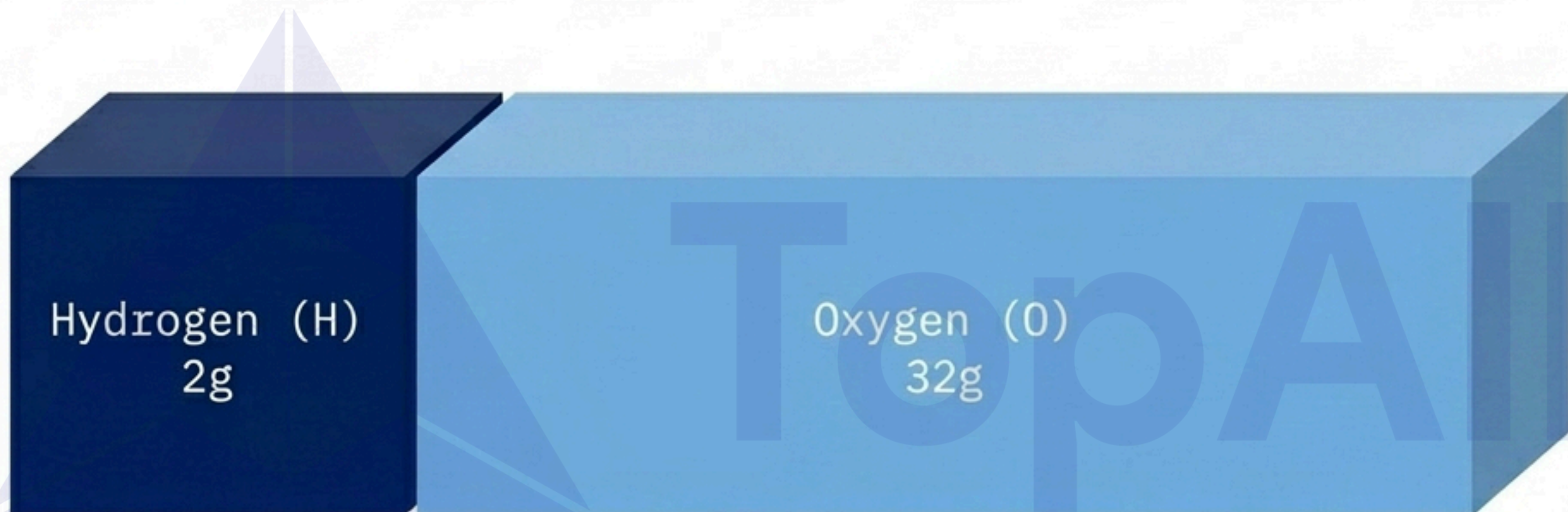
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Key Highlights

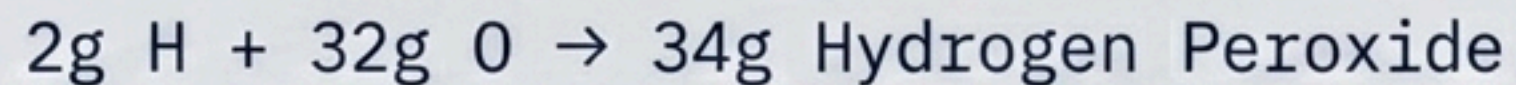
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Compound 2: Hydrogen Peroxide (H_2O_2)



Total Mass: **34g**



Note how the 2g Hydrogen mass remains fixed as the baseline control.

Calculating the Ratio

Water	Hydrogen Peroxide
Fixed Mass: 2g Hydrogen	
16g Oxygen	32g Oxygen

$$\text{Ratio} = 16:32 = 1:2$$

The masses of oxygen that combine with a fixed mass of hydrogen bear a simple **1:2 ratio**.

The Golden Rule of Multiple Proportions

Compare one element with a fixed mass of another.



Why this matters: By holding one element constant, Dalton revealed that the second element combines in **discrete, indivisible units (atoms)** represented by small whole numbers.



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