

Target 3: I can balance a chemical equation based on the law of conservation of mass.

## Law of Conservation of Mass

Simply stated, the law of conservation of mass means matter cannot be created or destroyed, but it can change forms.

### Law of Conservation of Mass in Chemistry

Mass cannot be gained or lost in a chemical reaction; the same number of atoms of each element MUST be present on each side of a chemical equation.

Credit for discovering The Law of Conservation may be given to either  
Mikhail Lomonosov or Antoine Lavoisier.



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Directions for Balancing Equations:

#1 RULE: ONLY Coefficients (Big #'s) can be added to chemical formulas when balancing equations. (NOT Subscripts (Little #'s.))

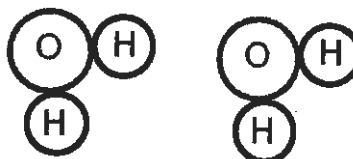
\*Coefficients apply to everything that they are in front of.

\*To figure out the number of each element, multiply:

COEFFICIENT X SUBSCRIPT

EXAMPLE: 2 H<sub>2</sub>O

PICTURE:

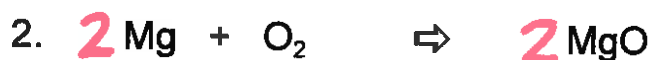


TOTALS: 4 H's (2x2) and 2 O's (2x1)

(\*Reminder: Subscripts only apply to the element on their left)

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EXAMPLES OF BALANCING EQUATIONS:



BALANCING WITH (PARENTHESES:)

\*The number outside of the parentheses applies (gets multiplied by) EVERYTHING inside.

EXAMPLE:  $(\text{NO}_3)_2 = 2 \text{ N's } (2 \times 1) \text{ and } 6 \text{ O's } (2 \times 3)$

\*To figure out how many atoms of each element, multiply ALL numbers that apply to that element.

EXAMPLE: How many Oxygen atoms are in this chemical formula?



There are  $2 \times 3 \times 2 = 12$

oxygen atoms

Draw Arrows that point to all numbers that apply to Oxygen

Answer:

PRACTICE PROBLEMS WITH (PARENTHESES:)

