Name: _____ **Date:** _____

Feeling the Weight of Atoms? Vibrant 10th Grade Stoichiometry Quiz

Sophomores strengthen foundational chemistry recall by identifying molar masses and calculating simple particle conversions using the mole as a counting unit.

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1. Which of the following is the standard numerical value for Avogadro's number, representing the count of particles in one mole?

A. 3.14 x 10^23
B. 6.022 x 10^23
C. 9.81 x 10^12
D. 1.60 x 10^-19

2. True or False: The molar mass of an element is numerically equal to its atomic mass found on the Periodic Table, but expressed in grams per mole (g/mol).

A. True
B. False

3. If you have a 1.0 mole sample of pure Silver (Ag), how many atoms of silver are present in that sample?

A. 107.9 atoms
B. 1 atom
C. 6.022 x 10^23 atoms
D. 3.011 x 10^23 atoms

4. Consider the reaction for making rust: $4Fe + 3O_2$ '$2Fe_2O_3$. According to the coefficients, what is the mole ratio of Iron (Fe) to Iron(III) oxide (Fe_2O_3)?

A. 4:2 (or 2:1)
B. 3:2
C. 1:1
D. 4:3

5. True or False: Stoichiometry is the study of the quantitative relationships between the amounts of reactants used and products formed by a chemical reaction.

A. True
B. False

6. The molar mass of Sodium Hydroxide (NaOH) is approximately ___ g/mol. (Use atomic masses: Na=23, O=16, H=1).

A. 24
B. 39
C. 50
D. 40

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7. If a balanced chemical equation shows a 1:2 ratio between reactant A and reactant B, how many moles of B are needed to react completely with 5 moles of A?

A. 2.5 moles
B. 5 moles
C. 10 moles
D. 20 moles

8. Which term describes the reactant that is completely consumed first in a reaction and determines the maximum amount of product that can be formed?

A. Excess reactant
B. Limiting reactant
C. Catalytic reactant
D. Theoretical reactant

9. True or False: To convert from the mass of a substance to the number of moles, you should multiply the mass by the molar mass.

A. True
B. False

10. What is the molar mass of Calcium Carbonate ($CaCO_3$)? (Use atomic masses: Ca=40, C=12, O=16).

A. 68 g/mol
B. 84 g/mol
C. 100 g/mol
D. 150 g/mol