ConcepTest Questions for Formulas and Moles

Question to test concept of moles and particles.

$Ca_3(PO_4)_2$ is a principle component of porcelain. How many phosphorus atoms are found in 1.00 mole of $Ca_3(PO_4)_2$?

1. 6.02×10^{23}
2. $4 \times 6.02 \times 10^{23}$
3. $2 \times 6.02 \times 10^{23}$
4. 2

Correct Answer: **3. $2 \times 6.02 \times 10^{23}$**
Comment to Instructor: choice 1 indicates they are focusing in on the "1 mole" and/or not applying subscript outside parenthesis; choice 2 indicates they are confused as to which element has subscript of 4; choice 4 indicates they do not know when to apply Avogadro's Number.

Question for relationship between moles and grams:

Calcium carbonate is commonly known as chalk and is the active ingredient in many antacids, such as Tums. How many moles of calcium carbonate are found in one 500. mg tablet of Tums? You may assume that Tums is pure calcium carbonate.

1. 0.00500 mole
2. 50 moles
3. 0.500 mole
4. 5 mole

Correct answer: **1. 0.00500 mole**
Comment to Instructor: in choice 2, student <u>multiplied</u> by molar mass; in choice 3, the student converted mg to grams and stopped; in choice 4, student didn't account for the milli- prefix. Molar mass of calcium carbonate is 100. g/mol.