Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_

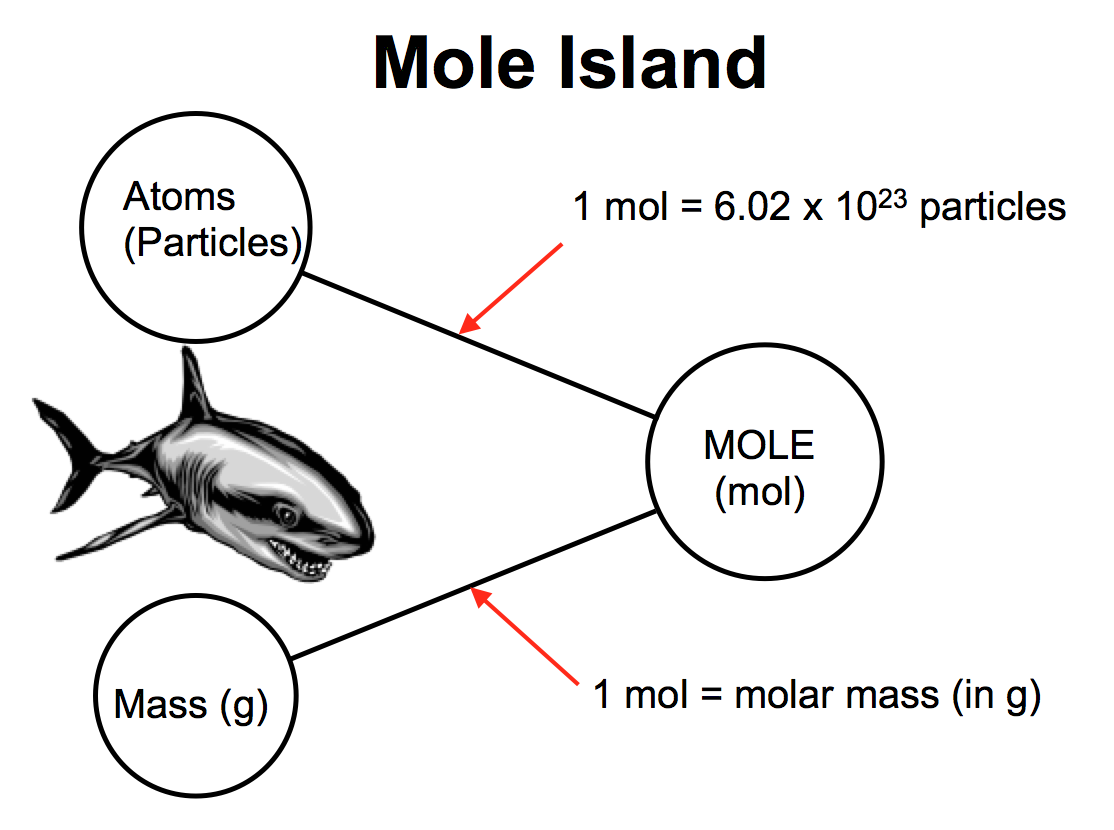
**STATION REVIEW: Mole Calculations**

Atoms are too small to see so we cannot count them by conventional methods. However, knowing how many atoms are present at the start of a reaction is crucial to understanding how much product can be produced through chemical means. Therefore, to count atoms we will use their relative mass on the periodic table to calculate the number of atoms present.

***Don’t forget:***

1 mole = 6.022x1023 items which in standard notation is 602,200,000,000,000,000,000,000 items. That’s a lot of items! To put this in perspective, if you had 1 mole of dollars, you could spend a billion dollars a second for OVER 19 million years before running out of money!

***Calculations:***

****Use “Mole Island” to help you navigate problems.

**Example 1: How many moles are in 3.4x1024 atoms of sodium?**

*3.4x1024 atoms 1 mole*

*6.022x1023 atoms*

*=5.6 mol*

**Example 2: How many atoms are in 52.1 grams of calcium?**

*52.1 grams 1 mol 6.022x1023 atoms*

*40.08 grams 1 mol*

=7.83 atoms

**\*Solve the following problems. Then fill in the letter of the correct answer on the riddle on the bottom of page 2. Underline your given and circle your desired before solving.**

1. How many atoms of lithium are in .0211 moles of lithium metal (Li)

*m. 1.27 x 1023 atoms n. 1.27 x 1022 atoms o. 6.35 x 1023 atoms p. 6.35 x 1022 atoms*

2) How many moles of neon are in 4.3 x 1024 atoms of neon (Ne)?

*m. 71 mol n. 0.71 mol o. 7.1 mol p. 2.6 x 1048 mol*

3) How many moles of sodium chloride are in 3.28 x 1023 formula units of sodium chloride (NaCl)?   
*\*Hint: Think of a formula unit as a particle.*

*q. 1.98 x 1047 mol r. 0.0545 mol s. 5.45 mol t. 0.545 mol*

4) How many carbon monoxide (CO) molecules are present in 1.55 moles of CO?

*m. 0.0933 molecules n. 0.933 molecules o. 24.8 molecules p. 9.33 molecules*

5) What is the mass of 3.72 moles of silver atoms?

*u. 401g v. 40.1 g w. 0.0344g x. 0.344g*

6) How many moles of mercury are in 1,026 grams of mercury?

*q. 511.5 mol r. 6.179 x 1026 mol s. 205,800 mol t. 5.115 mol*

7) How many atoms are in 80.2 grams of magnesium?

*h. 4.00 atoms i. 1.99 x 1024 atoms j. 1.99 x 1022 atoms k. 4.00 x 1024 atoms*

8) What is the mass, in grams, of 7.65 x 1023 atoms of sulfur?

*q. 0.407g r. 1.27g s. 0.127g t. 40.7g*

9) How many moles are in 99.5g of carbon?

*a. 5.99 x 1025 mol b. 0.0828 mol c. 1.00 mol d. 8.28 mol*

10) What is the mass, in grams, of 4.88 x 1024 atoms of beryllium?

*m. 52.1g n. 8.01 g o. 73.0 g p. 9.01g*

11) How many cesium atoms are in 0.015moles of cesium?

*u. 132.91 atoms v. 2.0 atoms w. 9.0 x 1021 atoms x. 9.0 x 1023 atoms*

12. What is the mass of 0.0033 moles of gold?

*m. 196.97g n. 0.65 g o. 65g p. 2.0 x 1021g*

**Have you heard about the chemist reading about that book on helium? He just could**

\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_!