|  |  |  |
| --- | --- | --- |
| **Student Objectives** | | |
| * Understand the concept of the mole and Avogadro's number. * Use factor-label to convert between moles, grams, and number of molecules. |  |  |

|  |  |
| --- | --- |
| **The Mole Concept:** |  |

You will need to be able to demonstrate that you can convert grams to moles, moles to molecules, and molecules to grams. Your paper periodic table and a "hand-held" calculator may be used during the quiz, but *nothing else*.

Read the essay by **Amedeo Avogadro** (1811) on a manner of determining the relative masses of the elementary molecules.



|  |  |
| --- | --- |
| |  | | --- | | **A Mole Is:**   * **6.02 x 1023 of anything.** * **The formula mass in grams of a substance contains one mole of particles.** * **Na = Avogadroës Number = 6.02 x 1023** | |

|  |  |  |
| --- | --- | --- |
|  | **The mole is important because:**   * **It allows us to weigh atoms in the lab.** * **It allows us to compare amounts of atoms in chemical reactions.** |  |

**Basic mole calculations: convert mass to moles, and moles to molecules or atoms.**

|  |  |
| --- | --- |
|  | **The following equalities are used in mole calculations:** |

**1 mole = 6.02 x 1023 atoms or molecules = formula mass in grams**

|  |  |
| --- | --- |
| |  | | --- | | **Examples of Mole Conversion Problems**:  These problems are set up correctly using Factor Label. Use a calculator to find each answer with the proper number of significant digits.   1. **Given 12.011 grams of carbon, how many atoms do you have?**  1. **Given 18 grams of water, how many molecules do you have?**  1. **Given 3.5 moles of sodium chloride, how many grams do you have?**  1. **What is the mass of 6.02 x 1023 molecules of silver nitrate?** | |

|  |  |
| --- | --- |
|  | Setting up the factor-label problem is just as important as the answer.  Form the habit of working neatly, canceling units, and circling the answer.  Remember, units are just as important as numbers in the answer. |

**Use this webtest to practice mass, mole, and formula mass (GFW).**

