

The Mole

- 1) **Activity – Paper Clip Inquiry on pg 286.**
- 2) Common conversion factors
 - 12 eggs = 1 dozen
 - 2 shoes = 1 pair
 - 500 sheets of paper = 1 ream
 - 144 pencils = 1 gross
- 3) Mole – measurement of the amount of substance.
 - 1 mol = 6.02×10^{23} representative particles (Avogadro's number)
The number stays with the unit they do not switch.
 - Amedeo Avogadro - Italian
 - Representative particle (atom, molecule, formula unit, ion)
- 4) Converting moles to particles. Avogadro's number is the conversion factor. Examples.
 - How do convert units.
 - Write what your given (just like Geometry) in the top left block.
 - Match units diagonally.
 - Up and down is a conversion factor.
 - Do the same for every conversion factor.
- 5) Mass to moles. Use the mass number, now called the atomic/molecular weight/gram formula mass, to get the conversion factor to a mole.
- 6) Calculating the molecular weight of a formula unit/molecule. Examples.
 - Mass of a mole = molar mass.
- 7) **Have students measure out 1 mol of salt and water. Comment on the differences. Predictions.** Examples
- 8) Avogadro's Hypothesis – equal volumes of gases at the same temperature and pressure contains equal numbers of particles.
- 9) Standard Temperature and Pressure (STP) 0°C (273 K) and 101.3 kPa (1 atm).
- 10) Therefore, 1 mole of a gas is exactly equal, at STP, to 22.4 L. This is true for every gas!!! (molar volume)
 - **Let the students brainstorm how you would show what 22.4 L looks like in real life.**
- 11) All roads lead to Rome. Well all roads lead to the mole. The mole road map. Pg 303.
- 12) **Practice on the white boards.**

Rd pg 287-303
HW: 1-7, 14-20

% Composition, EF/MF

- 1) **How much sugar really is in bubble gum? Students determine the amount of sugar in bubble gum. Give hints to provoke thought.**
- 2) Percent Composition (percent by mass) tells us the % of a compound that an element. Practical examples in their lives.
 - Percentage is part divided by whole. Therefore, grams of the element divided by grams of the compound.
 - Calculate with hydrates as well.
 - Can be done just by the formula or by actual numbers of the compound.
 - % by mass can be used as a conversion factor.
- 3) Empirical Formula – lowest whole-number ratio of the atoms of the elements in a compound.
- 4) Molecular Formula – can be the empirical formula or a whole number multiple of it.
- 5) **Empirical Formula of MgO Lab. Show the Empirical Formula through proof.**
- 6) Examples by percentages. Do separately and/or together.

Rd pg 305-311

HW: 8-13