**Unit 2: Learning Goals for Properties of Matter, Atomic Structure, and the Mole**

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| **Big Picture**: Students should understand how sub-atomic particles determine the properties of atoms and how scientists determine the number of particles in a sample. | | | |
| **Content Goals** | | **Skills Goals** | |
| Students will know how to:   * Classify samples of matter using the terms: homogeneous, heterogeneous, pure, mixture * Distinguish between elements and compounds * Use chemical symbols and names to identify common elements * Explain contributions of Dalton, Thomson, and Rutherford to atomic theory * Describe properties of subatomic particles (protons, neutrons, electrons): mass, charge, and location in atom, * Determine atomic number, mass number, and charge based on number of protons, neutrons, and electrons * Determine protons, neutrons, and electrons based on atomic number, mass number, and charge * Explain how changes in subatomic particles produce ions and isotopes * Write a nuclear symbol (isotopic notation) for isotopes and ions * Determine average atomic mass based on isotope mass and relative or percent abundances * Determine the formula mass for compounds * Define the mole as a unit used in chemistry * Make conversions between mass, moles, and particles | | Students will be able to:   * Present qualitative and quantitative data in well-organized tables * Graph data appropriately * Identify topic and main idea of scientific text * Identify key supporting statements in scientific text * Assess reliability of scientific text | |
| **Assessment**: How will mastery of content and skills be assessed?  Laboratory behavior and student lab reports will show if students can:   * Work safely in the laboratory * Follow detailed laboratory procedures * Prepare well-organized data tables, and make informative graphs   Quizzes and tests will show if students have mastered the content goals. | | | |
| **Key Vocabulary:**  Matter  Heterogeneous mixture  Homogeneous mixture  Element  Compound  Proton  Neutron  Electron  Nucleus | Dalton  Thomson  Rutherford  Atomic number  Mass number  Nuclear symbol  Atomic Mass  Isotope  Ion  Ionic charge | | Formula mass (molar mass)  Mole  Avogadro’s number  Effect  Affect |

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**Joke:**

An atom walks into a bar …

Bartender: Hi there, what are you looking for?

Atom: Well, I’ve lost an electron.

Bartender: Oh dear, are you sure?

Atom: Yes! I’m absolutely positive.