**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
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| **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:**MatterHeterogeneous mixtureHomogeneous mixtureElement CompoundProtonNeutronElectronNucleus | DaltonThomsonRutherfordAtomic numberMass numberNuclear symbolAtomic Mass IsotopeIonIonic charge | Formula mass (molar mass)MoleAvogadro’s numberEffectAffect |

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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.