


Chemistry Curriculum Bundle #3

Title		Suggested Dates
The Atom		10/5-10/23 (14 days)

Big Idea/Enduring Understanding	Guiding Questions
Everything in the universe is made up of atoms, which are in turn made up of protons, neutrons, and electrons. The subatomic particles are alike; their configuration as different atoms makes different elements.	What's in your atoms?

The resources included here provide teaching examples and/or meaningful learning experiences to address the District Curriculum. In order to address the TEKS to the proper depth and complexity, teachers are encouraged to use resources to the degree that they are congruent with the TEKS and research-based best practices. Teaching using only the suggested resources does not guarantee student mastery of all standards. Teachers must use professional judgment to select among these and/or other resources to teach the district curriculum.

Knowledge & Skills with Student Expectations	District Specificity/Examples	Suggested Resources (See note above)
<p>3 Uses scientific methods during fields & laboratory investigations.</p> <p>3E Evaluate models according to their adequacy in representing chemistry objects or events.</p> <p>3F Research and describe the history of chemistry and contributions of scientists.</p>	<p>Such as</p> <ul style="list-style-type: none"> • Mendeleev, Dalton, Rutherford, Bohr, Curie, Moseley, Boyle, Charles, Gay-Lussac 	<p>Ernest Rutherford Flash Animation McGraw Hill http://www.mhhe.com/physsci/chemistry/essentialchemistry/flash/ruther14.swf</p> <p>Demonstration Use a gold helium balloon (as the nucleus) and throw ping-pong balls (alpha particles) at the gold balloon to demonstrate Rutherford's Gold Foil Experiment.</p>
<p>6 The student knows that atomic structure is determined by nuclear composition, allowable electron cloud, and subatomic particles.</p> <p>6B Analyze stable and unstable isotopes of an element to determine the relationship between the isotope's stability and its application.</p>	<p>Including</p> <ul style="list-style-type: none"> • Use hyphen notation and nuclear symbol (superscript mass number and subscript atomic number with charge on the right as a superscript) • Calculate an element's average atomic mass • Determine the stability of an isotope by using the band of stability 	<p>Pennium Lab – Average Atomic Mass See chemistry resource folder</p> <p>Band of Stability Activity http://www.sciencegeek.net/Chemistry/chempdfs/Band_of_Stability.pdf</p> <p>Atomic Structure Interactive Review http://www.sciencegeek.net/Chemistry/taters/Unit1AtomicStructure.htm</p>

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<p>6 The student knows that atomic structure is determined by nuclear composition, allowable electron cloud, and subatomic particles.</p> <p>6A Describe the existence and properties of subatomic particles.</p>	<p>Including</p> <ul style="list-style-type: none">• Summarize the historic development of atomic theory• Describe particles, properties, and location of subatomic particles<ul style="list-style-type: none">• Protons• Neutrons• Electrons• Identify in atoms and common ions<ul style="list-style-type: none">• Mass number• Atomic number• Charge• Number of protons• Neutrons• Electrons• Differentiate among an element's<ul style="list-style-type: none">• Atomic mass (1/12 of mass of carbon-12)• Mass number• Describe and apply the law of definite composition and multiple proportions <p><i>understand the experimental design and conclusions used in the development of modern atomic theory, including Dalton's Postulates, Thomson's discovery of electron properties, Rutherford's nuclear atom, and Bohr's nuclear atom</i></p> <p><i>understand the electromagnetic spectrum and the mathematical relationships between energy, frequency, and wavelength of light</i></p> <p><i>calculate the wavelength, frequency, and energy of light using Planck's constant and the speed of light;</i></p> <p><i>use isotopic composition to calculate average atomic mass of an element</i></p> <p><i>express the arrangement of electrons in atoms through electron configurations and Lewis valence electron dot structures</i></p>	<p>CPO Science Atom Building Game http://www.cpo.com/em_atombuilding.shtml</p>
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<p>6 The student knows that atomic structure is determined by nuclear composition, allowable electron cloud, and subatomic particles.</p> <p>6C Summarize the historical development of the periodic table to understand the concept of periodicity.</p>	<p>Including</p> <ul style="list-style-type: none"> • Summarize the periodic tables of Mendeleev and Mosley and compare to modern periodic table • Explain the periodic table with respect to atomic number and observed patterns <p><i>explain the use of chemical and physical properties in the historical development of the Periodic Table</i></p> <p><i>use the Periodic Table to identify and explain the properties of chemical families, including alkali metals, alkaline earth metals, halogens, noble gases, and transition metals</i></p> <p><i>use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy</i></p>	<p>The Element Song http://www.privatehand.com/flash/elements.html</p> <p>Development of Periodic Table PowerPoint See chemistry resource folder</p> <p>World of Chemistry Video Series: The Periodic Table http://learner.org/resources/series61.html</p> <p>History of the Periodic Table (creative writing assignment) http://web.buddyproject.org/web017/web017/history.html</p> <p>Designing Periodic Table Puzzle See chemistry resource folder</p>
<p>4 The student knows the characteristics of matter.</p> <p>4D Describe the physical and chemical characteristics of an element using the periodic table and make inferences about its chemical behavior.</p>	<p>Including</p> <ul style="list-style-type: none"> • Describe <ul style="list-style-type: none"> ○ Rows (periods) ○ Columns (groups/families) ○ Periodic trends (electronegativity) ○ Atomic radius ○ Reactivity ○ Properties and location of metals, nonmetals, and metalloids ○ Representative elements (group names and properties) ○ Location of transition metals ○ Ionization energy (PAP) ○ Ionic radius (PAP) • Use the periodic table to determine <ul style="list-style-type: none"> ○ Oxidation numbers ○ Type of bonding 	<p>Element on Tissue Box Project See chemistry resource folder</p> <p>Periodic Table for Trends See chemistry resource folder</p> <p>Periodic Table Trends pg 2 See chemistry resource folder</p> <p>Development of Periodic Table PowerPoint See chemistry resource folder</p> <p>Periodic Table Trends PowerPoint See chemistry resource folder</p> <p>Periodic Law Lab See chemistry resource folder</p> <p>What element am I See chemistry resource folder</p>