



Chemistry Curriculum Bundle # 3

Title	 	Suggested Dates
The Atom		10/4 -10/22 (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>5 Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:</p> <p>5A explain the use of chemical and physical properties in the historical development of the Periodic Table;</p>	<p>Such as Mendeleev, Dalton, Rutherford, Bohr, Curie, Moseley, Boyle, Charles, Gay-Lussac</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>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>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>

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<p>5 Science concepts. The student understands the historical development of the Periodic Table and can apply its predictive power. The student is expected to:</p> <p>5B 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; and</p> <p>5C use the Periodic Table to identify and explain periodic trends, including atomic and ionic radii, electronegativity, and ionization energy.</p>	<p>Know the organization of the periodic table. CCRS</p> <p><i>a. Identify periods and groups on the periodic table.</i></p> <p><i>b. Identify metals, metalloids, and nonmetals on the periodic table.</i></p> <p><i>c. Distinguish between and describe patterns in electron configurations for representative elements, transition elements, inner-transition elements, and noble gases. Predict the common charges on the representative elements from the periodic table. CCRS</i></p> <p>Recognize the trends in physical and chemical properties as one moves across a period or vertically through a group. CCRS</p> <p><i>a. Define and describe the periodic trend: atomic radii, ionic radii, ionization energy, electron affinity, and electronegativity.</i></p> <p><i>b. Use the periodic trends to compare the size and behavior of atoms and ions. CCRS</i></p> <p>Including</p> <ul style="list-style-type: none">• Describe<ul style="list-style-type: none">○ Rows (periods)○ Columns (groups/families)○ Atomic radius○ Reactivity○ Properties and location of metals, nonmetals, and metalloids○ Representative elements (group names and properties)○ Location of transition metals○ Periodic Trends<ul style="list-style-type: none">◇ Ionization energy◇ Electronegativity◇ Ionic radius◇ Electron Affinity (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>
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6 Science concepts. The student knows and understands the historical development of atomic theory. The student is expected to:

6A 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;

Summarize the development of atomic theory. Understand that models of the atom are used to help us understand the properties of elements and compounds. CCRS
a. Describe the discoveries of Dalton (atomic theory), Thomson (the electron), Rutherford (the nucleus), and Bohr (planetary model of the atom); understand how each discovery contributed to modern atomic theory.
b. Identify the masses, charges, and locations of the major components of the atom (protons, neutrons, and electrons); describe Rutherford's "gold foil" experiment that led to the discovery of the atomic nucleus; describe Millikan's "oil drop" experiment that led to determining the charge on an electron.

Including

- Summarize the historic development of atomic theory
- Describe particles, properties, and location of subatomic particles
 - Protons
 - Neutrons
 - Electrons
- Identify in atoms and common ions
 - Mass number
 - Atomic number
 - Charge
 - Number of protons
 - Neutrons
 - Electrons
- Differentiate among an element's
 - Atomic mass (1/12 of mass of carbon-12)
 - Mass number
- Describe and apply the law of definite composition and multiple proportions

CPO Science

Atom Building Game

http://www.cpo.com/em_atombuilding.shtml

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<p>6D use isotopic composition to calculate average atomic mass of an element; and</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 	<p>Pennium Lab – Average Atomic Mass See chemistry resource folder (Pre-AP)</p> <p>Bennium Lab- Average Atomic Mass See chemistry resource folder</p> <p>Atomic Structure Interactive Review http://www.sciencegeek.net/Chemistry/taters/Unit1AtomicStructure.htm</p>
<p>Chem.7 Science concepts. The student knows how atoms form ionic, metallic, and covalent bonds. The student is expected to:</p> <p>7A name ionic compounds containing main group or transition metals, covalent compounds, acids, and bases, using International Union of Pure and Applied Chemistry (IUPAC) nomenclature rules;</p> <p>7B write the chemical formulas of common polyatomic ions, ionic compounds containing main group or transition metals, covalent compounds, acids, and bases;</p>	<p>Know formulas for ionic compounds. CCRS <i>a. Name and write formulas for binary and ternary ionic compounds, using Group A (representative) metals and Group B (transition) metals, including those containing common polyatomic ions, (e.g., nitrate, sulfate, carbonate, ammonium, phosphate, hydroxide). CCRS</i></p> <p>Know formulas for molecular compounds. CCRS <i>a. Name and write formulas for binary molecular compounds and acids.</i> <i>b. Categorize a compound as ionic or molecular. CCRS</i></p> <p>Including</p> <ul style="list-style-type: none"> • Use the periodic table to determine oxidation numbers • Name and write formulas for ionic compounds and polyatomic ions • Name and write formulas for molecular compounds • Name and write formulas for binary and oxyacids 	<p>Fun and Games in Chemistry Claudia Wallace and Jane Smith Writing Chemical Names and Formulas http://cast2007.smithwallace.googlepages.com/home</p> <p>Dice Game-Cation Cards See chemistry resource folder</p> <p>Dice Game-Anions Cards See chemistry resource folder</p> <p>Dice Game-Blank Cards See chemistry resource folder</p> <p>Chemistry Around the House Project See chemistry resource folder</p> <p>Chemistry Around the House Rubric See chemistry resource folder</p>