


8th Grade Science Curriculum Bundle #3

Title		Suggested Dates
Matter: Its Structure and Properties		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 particle configuration determines how different atoms make different elements.	<p>How is it that everything is made from the elements on the periodic table?</p> <p>What makes each atom/element unique?</p> <p>How do observable properties of matter enable us to determine the structure of atoms?</p>

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	Specificity & Examples	Suggested Resources (Read the note above)
<p>8.8 The student knows that matter is composed of atoms.</p> <p>8.8A Describe the structure and parts of an atom.</p>	<p>Including: Parts</p> <ul style="list-style-type: none"> --- Protons --- Neutrons <ul style="list-style-type: none"> • Dense --- Electrons <ul style="list-style-type: none"> • Electron cloud • Energy level • Empty space • Moving electrons • Electron configuration (2-8-8-2) up to atomic number 20 --- Nucleus --- Electron cloud --- Mass comparison and location of subatomic parts <p><u>Teacher Note:</u> Describe structure and parts in elements up to atomic number 20 ONLY.</p> <p><i>Describe the structure of atoms, including the masses, electrical charges, and locations, of protons and neutrons in the nucleus and electrons in the electron cloud.</i></p>	<p>VOCABULARY: chemistry, chemist, atoms, element, nucleus, proton, neutron, electron, subatomic particles, atoms, element, periodic table, energy levels, electron cloud, atomic number, atomic mass, atomic weight, valence electron, metal, nonmetal, metalloid, solid, liquid, gas, plasma, group, and period.</p> <p>AVID Activity- Writing in Science pages 55-94 “Experimental Design Lab Report Activities”</p> <p>CORE ACTIVITY: Proton, Neutron and Electron Practice Worksheet</p> <p>Atomic musical chairs @ www.middleschoolscience.com/atomicmusicalchairs.pdf</p> <p>PREAP: LTF #8: Electron Configuration and Orbital Notation Chem/Physics p. 314</p> <p>Protons, Neutrons, and Electron Practice Worksheet</p> <p>Atomic Structure and History Power point</p> <p>Uncovering Student Ideas in Science, Keeley. Vol 3 #1, Pennies</p>

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<p>8.8 The student knows that matter is composed of atoms.</p> <p>8.8B Identify the properties of an atom including mass and electrical charge.</p>	<p>Including:</p> <p>--- Mass</p> <ul style="list-style-type: none"> • Atomic number and atomic mass relationship to atomic particles • Average Atomic mass rounds to mass number • Atomic number and atomic mass in relation to periodic table. <p>--- Electrical charge</p> <ul style="list-style-type: none"> • Neutrality • Valence electrons 	<p>CORE ACTIVITY: Periodic Table Basics Part I @ http://sciencespot.net/Pages/classchem.html#Anchor-htable</p> <p>CORE ACTIVITY PREAP: Periodic Table Basics Part II @ http://sciencespot.net/Pages/classchem.html#Anchor-htable</p> <p>PREAP: LTF #13: Light Up My Life Chem/Physics p. 382 and LTF #14: Electrolytes and Non-Electrolytes Chem/Physics p. 388</p> <p>PREAP Only: Discuss Ions</p>
<p>8.9 The student knows that substances have chemical and physical properties.</p> <p>8.9B Interpret information on the periodic table to understand that physical properties are used to group elements.</p>	<p>Including:</p> <p>--- Periods</p> <p>--- Groups or Families</p> <p>--- Explain how elements are classified in the Periodic Table as</p> <ul style="list-style-type: none"> • Solid/liquid/gas/plasma • Valence electrons • Metals • Nonmetals • Metalloids • Atomic number • Atomic mass/weight <p><u>Teacher Note:</u> It is not necessary to teach ions or bonding.</p>	<p>TECHNOLOGY: Adopt An Element</p> <p>http://www.allperiodictables.com/aptpages/apt_1_CC_Ler.html</p> <p>Which Group Are You In? (Reinforcement #3: One Stop Planner)</p> <p>Periodic Table Families – (website address below) http://www.middleschoolscience.com/periodictablefamilies.pdf</p> <p><u>Teacher Note:</u> This activity will need added direction from instructor.</p> <p>http://sciencespot.net/Media/adtelempjt.pdf</p> <p>What is matter?</p> <p>“Identify an Unknown Chemical Mixture” @ http://chemistry.about.com/od/chemistryexperiments/a/aa072604a.htm</p> <p>Missing Cousin Lab</p> <p>Chemistry Aliens</p>
<p>8.9 The student knows that substances have chemical and physical properties.</p> <p>8.9D Identify that physical and chemical properties influence the development and application of everyday</p>	<p>Such as:</p> <p>--- Cooking surfaces</p> <p>--- Insulation</p> <p>--- Adhesives</p> <p>--- Plastics</p>	<p>The Cool Lab @ http://education.jlab.org</p>

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materials such as cooking surfaces, insulation, adhesives, and plastics.		
<p>8.1 The student conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices.</p> <p>8.1A Demonstrate safe practices during field and laboratory investigations.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Lab Cleanup Procedures --- Chemical and waste disposal --- Equipment cleaning and storage --- Safety contract <p>In accordance with the Texas Safety Standards: <u>Pflugerville ISD :: Online Curriculum :: Science</u></p> <p><u>Teacher Note:</u> Safety skills and process TEKS should be embedded and reinforced throughout the year.</p>	<p>Texas Safety Standards</p>
<p>8.1 The student conducts field and laboratory investigations using safe, environmentally appropriate, and ethical practices.</p> <p>8.1B Make wise choices in the use and conservation of resources and the disposal and recycling of materials.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Lab material disposal/hazardous materials (MSDS listing) 	
<p>8.2 The student uses scientific inquiry methods during fields and laboratory investigations.</p> <p>8.2A Plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology.</p>	<p>Such as:</p> <ul style="list-style-type: none"> --- design their own experiments --- Emphasis should be on scientific methods and should build understanding of the variety of methods and their suitability for various tasks. <p><u>Teacher Note:</u> It is recommended that students create and design at least 2 labs/experiments.</p>	<p>AVID Activity- Writing in Science pages 55-94 “Experimental Design Lab Report Activities”</p>
<p>8.2 The student uses scientific inquiry methods during fields and laboratory investigations.</p> <p>8.2B Collect information by observing and measuring.</p>	<p>Such as:</p> <ul style="list-style-type: none"> --- Measuring temperature with thermometer --- Pre-AP: Emphasis on using probeware in a variety of situations <p><u>Teacher Note:</u> Measurement exercises should progress across the middle school grade levels and begin by developing conceptual understanding. In 8th grade, students can begin to convert from one unit to another.</p>	<p>AVID Activity- Writing in Science pages 26-28 “Observation Narrative”</p>
<p>8.2 The student uses scientific inquiry methods during fields and laboratory investigations.</p> <p>8.2C Organize, analyze, evaluate, make inferences and predict trends from direct and indirect evidence.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- graph interpretation and extrapolation --- predicting outcomes based on data tables 	<p>Book: <u>Great Graphs in 10 Days</u> By: BK Hixson</p> <p>AVID Activity- Writing in Science pages 29-30 “Comparative Analysis”</p>

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<p>8.2 The student uses scientific inquiry methods during fields and laboratory investigations.</p> <p>8.2D Communicate valid conclusions.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Experimental conclusions --- Supporting conclusions with data --- Analyze error sources and fix experiment to reduce outside variables --- Graph/Chart/Table extrapolation for conclusion --- Analysis of graphs 	<p>AVID Activity- Reading in Science pages 111-132 “ Additional Active Reading Graphic Organizers”</p>
<p>8.2 The student uses scientific inquiry methods during fields and laboratory investigations.</p> <p>8.2E Construct graphs, tables, maps, and charts using tools including computers to organize, examine and evaluate data.</p>	<p>Such as:</p> <ul style="list-style-type: none"> --- Bar graphs, line graphs, pie charts, data tables, and determine which is best for each set of data. 	<p>Book: <u>Great Graphs in 10 Days</u> By: BK Hixson</p> <p>Science Graphing Pack -Acid-Base Indicators Graph</p>
<p>8.3 The student uses critical thinking and scientific problem solving to make informed decisions.</p> <p>8.3A Analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Critique a conclusion of a modeled experiment. <p><u>Teacher Note:</u> Current event analysis that critiques a scientific explanation. Relate to labs throughout the year. Should emphasize the nature of scientific explanations: testability, repeatability, evidence, and predictive nature.</p>	
<p>8.3 The student uses critical thinking and scientific problem solving to make informed decisions.</p> <p>8.3B Draw inferences based on information related to promotional materials for products and services</p>	<p>Such as:</p> <ul style="list-style-type: none"> --- interpreting product labels such as MSDS labels. 	
<p>8.3 The student uses critical thinking and scientific problem solving to make informed decisions.</p> <p>8.3C Represent the natural world using models and identify their limitations.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Distinguish between limitations and advantages of models <p>Such as</p> <ul style="list-style-type: none"> --- Atom models ---Historical atomic theory <p><i>Use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature.</i></p> <p><i>Identify advantages and limitations of models such as size, scale, properties, and materials.</i></p>	<p><u>CORE ACTIVITY:</u> Bohr Models – 2D or 3D</p> <p><u>Uncovering Student Ideas in Science</u>, Keeley, Vol. 4, #10, Is It a Model?</p> <p>PREAP: LTF # 5: Rutherford Simulation Chem/Physics p. 286</p> <p>PREAP: Electron Dot Diagrams ATE p. 90</p> <p>PREAP: Lewis Dot Diagrams</p>
<p>8.3 The student uses critical thinking and scientific problem solving to make informed decisions.</p> <p>8.3D Evaluate the impact of research on scientific</p>	<p><u>Teacher Note:</u></p> <p>Do a current event impact analysis that looks at how scientific research has impacted thought, society and the</p>	<p><u>AVID Activity:</u> Writing in Science page 24 “Brief Autobiography”.</p>

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<p>thought, society, and the environment.</p>	<p>environment. Such as how the historical evolution of the periodic table has impacted today's chemists and introduced newer laboratory simulated elements.</p>	
<p>8.3 The student uses critical thinking and scientific problem solving to make informed decisions.</p> <p>8.3E Connect Grade 8 science concepts with the history of science and contributions of scientists.</p>	<p>Such as:</p> <p>--- Rutherford, Democritus, Dalton, Thompson, Bohr, Schrodinger, Heisenberg, Lavoisier, Lelior, Mendeleev, Albert Einstein, Enrique Fermi</p>	
<p>8.4 The student knows how to use a variety of tools and methods to conduct science inquiry.</p> <p>8.4A Collect, record, and analyze information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, hot plates, dissecting equipment, test tubes, safety goggles, spring scales, balances, microscopes, telescopes, thermometers, calculators, field equipment, computers, computer probes, water test kits, and timing devices.</p>	<p>Such as:</p> <p>--- <u>The TAKS formulated Periodic Table and Formula Chart</u></p>	
<p>8.4 The student knows how to use a variety of tools and methods to conduct science inquiry.</p> <p>8.4B Extrapolate from collected information to make predictions.</p>	<p>Such as:</p> <p>--- extrapolating using graph and data tables to predict expected results.</p>	