


Sixth Grade Science Curriculum Bundle # 5

Title		Suggested Dates
Periodic Table/Cells		November 16-December 4 (12 days)

Big Idea/Enduring Understanding	Guiding Questions
The periodic table is a useful way to organize our knowledge of the elements. All organisms are made up of cells.	How are chemical symbols used in the real world? How does the cell theory help us determine if things are living or nonliving?

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>6.8 The student knows that complex interactions occur between matter and energy.</p> <p>6.8A Define matter and energy.</p>	<p>---Continuation from Bundle 4 finish Periodic Table</p> <p>Including:</p> <p>---Properties of the Periodic Table (metals, nonmetals, and metalloids)</p> <p>---Identify Chemical Symbols (the first 20 elements)</p> <p>---Identify Chemical formulas for the following compounds such as H₂O (water), CO₂ (Carbon Dioxide), NaCl (Sodium Chloride—salt), HCl (Hydrochloric Acid), NaCHO₃ (Baking Soda), CH₄ (Methane)</p> <p><u>Teacher Note:</u> <i>Matter can be classified as elements, compounds, or mixtures. Students have already had experience with mixtures in Grade 5, so Grade 6 will concentrate on developing an understanding of elements and compounds. It is important that students learn the differences between elements and compounds based on observations, description of physical properties, and chemical reactions. Elements are represented by chemical symbols, while compounds are represented by chemical formulas. Subsequent grades will learn about the differences at the molecular and atomic level.</i></p> <p><u>Teacher Note:</u> <i>Elements are classified as metals, nonmetals, and metalloids based on their physical</i></p>	<p>Vocabulary: matter, chemical symbol, chemical formula, periodic table, elements, compounds, metals, nonmetals, metalloids, cell theory, prokaryotic, eukaryotic, unicellular, multi-cellular, cell</p> <p>AVID Activity- Writing in Science pages 22-23 “Pre-write and Quickwrite”</p> <p>*Activities should focus more on the Periodic Table</p> <p>Technology: Matter Webquest http://www.sciencespot.net/Media/statesofmatter.pdf</p> <p>www.chem4kids.com Periodic Table</p> <p>http://www.nclark.net/PeriodicTable Periodic Table Activities</p> <p>http://dubber6.tripod.com/whereisit/id52.html Periodic Table Resources</p>

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	<p><i>properties. The elements are divided into three groups on the Periodic Table. Each different substance usually has a different density, so density can be used as an identifying property. Therefore, calculating density aids classification of substances.</i></p>	
<p>6.1 Conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices.</p> <p>6.1A Demonstrate safe practices during field and laboratory investigations.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Chemical use and disposal --- Safe practices with lab equipment --- Continue to follow District Safety Contract --- Continue to operate in accordance with the Texas Safety Standards <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>6.1 Conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices.</p> <p>6.1B 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"> --- Recycling of lab materials 	
<p>6.2 Uses scientific methods during fields and laboratory investigations.</p> <p>6.2A Plan and implement descriptive and simple experimental investigations, including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Independent and dependent variables --- Controls --- Procedures --- Materials --- Using a standard lab report format <p><u>Teacher Note:</u> Emphasize that not all parts of scientific method may be used for every investigation and the ones that are used depends on the task.</p>	<p>AVID Activity- Writing in Science pages 55-94 “Experimental Design Lab Report Activities”</p>
<p>6.2 Uses scientific methods during fields and laboratory investigations.</p> <p>6.2B Collect information by observing and measuring.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Collecting information using the metric system <ul style="list-style-type: none"> • Introduce metric system --- Pre-AP: Emphasis on using probe ware 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 sixth grade it is most important to learn the different metric units (meter, kilogram, liter, etc.) and develop an intuitive sense of the size of them (a meter is about the height of a doorknob, a</p>	<p>AVID Activity- Writing in Science pages 26-28 “Observation Narrative”</p>

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	paperclip is about 1 gram, etc.)	
	NEW TEK 2010-2011: <i>Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers.</i>	
<p>6.2 Uses scientific methods during fields and laboratory investigations.</p> <p>6.2C Analyze and interpret information to construct reasonable explanations from direct and indirect evidence.</p>	<p>Including:</p> <p>--- Look for trends and/or patterns specific in the data and/or graph</p>	AVID Activity- Writing in Science pages 29-30 “Comparative Analysis”
<p>6.2 Uses scientific methods during fields and laboratory investigations.</p> <p>6.2D Communicate valid conclusions.</p>	<p>Including:</p> <p>--- Relate conclusion to hypothesis/problem</p> <p>--- Identify sources of error/ways to improve investigation</p> <p>--- Communicate conclusion effectively in writing</p>	AVID Activity- Reading in Science pages 111-132 “Additional Active Reading Graphic Organizers”
<p>6.2 Uses scientific methods during fields and laboratory investigations.</p> <p>6.2E Construct simple graphs, tables, maps, and charts using tools including computers to organize, examine and evaluate data.</p>	<p>Including:</p> <p>--- Organization of data</p> <ul style="list-style-type: none"> • data charts <p>--- Graphing data-bar graph & line graph</p> <ul style="list-style-type: none"> • label each axis with name and units • provide a descriptive title <p>--- Identify appropriate use of different types of data representation</p>	
<p>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</p> <p>6.3A Analyze, review, and critique scientific explanations, including hypotheses and theories as to their strengths and weaknesses using scientific evidence and information.</p>	<p><u>Teacher Note:</u> Emphasize the nature of scientific explanations: testability, repeatability, evidence, predictive nature.</p>	
<p>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</p> <p>6.3B Draw inferences based on information related to promotional materials for products and services.</p>	<p>Such as:</p> <p>--- Product labels relating to chemistry</p> <ul style="list-style-type: none"> • Cooking surfaces • Insulation • Heating • Plastics • Other products 	

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<p>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</p> <p>6.3C Represent the natural world using models and identify their limitations.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Conceptual <ul style="list-style-type: none"> • Scientific Method • Phases changes Concept map • Periodic Table --- Mathematical <ul style="list-style-type: none"> • Graphs to make predictions --- Physical <ul style="list-style-type: none"> • Particle arrangement <p><u>Teacher Note:</u> Use models to represent aspects of the natural world and identify advantages and limitations of models such as size, scale, properties, and materials.</p>	
<p>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</p> <p>6.3D Evaluate the impact of research on scientific thought, society, and the environment.</p>	<p>Such as:</p> <ul style="list-style-type: none"> -- Current events on matter 	<p><u>AVID Activity:</u> Writing in Science page 24 “Brief Autobiography”.</p>
<p>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</p> <p>6.3E Connect Grade 6 science concepts with the history of science and contributions of scientists.</p>	<p>Such as:</p> <ul style="list-style-type: none"> --- Dmitri Mendeleev-Periodic Table 	
<p>6.4 Knows how to use a variety of tools and methods to conduct science inquiry.</p> <p>6.4A Collect, analyze, and record information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, timing devices, hot plates, test tubes, safety goggles, spring scales, magnets, balances, microscopes, telescopes, thermometers, calculators, field equipment, compasses, computers, and computer probes.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Journals/notebooks --- Data collection tools as appropriate <p><u>Teacher Note:</u> use appropriate tools to collect, record, and analyze information, including journals/notebooks, beakers, Petri dishes, meter sticks, graduated cylinders, hot plates, test tubes, triple beam balances, microscopes, thermometers, calculators, computers, timing devices, and other equipment as needed to teach the curriculum.</p>	
<p>6.4 Knows how to use a variety of tools and methods to conduct science inquiry.</p> <p>6.4B Identify patterns in collected information using percent, average, range, and frequency.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Use descriptive statistics including frequency, range, mean, median, and mode <p><u>Teacher Note:</u> Data needs to be in metric system and decimals rather than fractions.</p>	

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<p>6.5 The student knows that systems may combine with other systems to form a larger system.</p> <p>6.5B Describe how the properties of a system are different from the properties of its parts.</p>	<p>Including:</p> <p>--- Systems -properties of parts and properties of whole:</p> <ul style="list-style-type: none"> • States of Matter • Periodic Table 	
<p>6.10 The student knows the relationship between structure and function in living systems.</p> <p>6.10A Differentiate between structure and function.</p>	<p>Including:</p> <p>---Classify organisms into Domains and Kingdoms Taxonomic groups share similar characteristics which allow them to interact with the living and nonliving parts of their ecosystem.</p> <p><u>New TEK 2010-2011:</u> Identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multi-cellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized Kingdoms</p>	<p>http://www.cals.ncsu.edu/course/zo150/mozley/domkingd.html Domain and Kingdom Resource page</p> <p>http://science-class.net/Biology/Classification.htm Resource Page</p> <p>http://sciencespot.net/Pages/classbio.html#invert Science Spot Resource Page</p> <p>http://www.microbeworld.org/resources/experiment/pgs1-6.pdf Creepy Critters Activity</p>
<p>6.10 The student knows the relationship between structure and function in living systems.</p> <p>6.10B Determine that all organisms are composed of cells that carry on functions to sustain life.</p>	<p>Including:</p> <p>--- Cell theory</p> <p>Teacher Note: New TEK for 7th grade focuses on the parts of a cell. This section should focus on cell theory, the idea that cells carry out the processes that allow life, whether it is a unicellular or multi-cellular organisms and if it is prokaryotic/ eukaryotic cells.</p> <p><u>New TEK 2010-2011:</u> Understand that all organisms are composed of one or more cells</p> <p><u>New TEK 2010-2011:</u> Recognize that the presence of a nucleus determines whether a cell is prokaryotic or eukaryotic</p> <p><u>New TEK 2010-2011:</u> Identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multi-cellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized Kingdoms</p>	<p>Uncovering Student Ideas in Science, Keeley, Vol 3, #15, Cells and Size</p> <p>-Use Microviewer, Microscope or both for students to observe prepared slides of prokaryotes, eukaryotes</p> <p>http://burtonbiology.com/cells/celloverview.pdf Cell Overview</p> <p>-Microscope Lab and Resources at www.sciencespot.net Under “Biology”</p> <p>-Technology: Cell Theory Webquest www.schools.manatee.k12.fl.us/072JOCONNOR/cellhistory/#Task</p> <p>http://www.worldofteaching.com/powerpoints/biology/The%20Cell%20Theory.ppt Cell Theory PPT</p> <p>Gateway Book Microscope and Cells TE pages 109-117 SE 164-178</p>

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<p>6.10 The student knows the relationship between structure and function in living systems.</p> <p>6.10C Identify how structure complements function at different levels of organization, including organs, organ systems, organisms, and populations.</p>	<p>--- Include prokaryotic and eukaryotic examples --- Each type of cell, tissue, and organ has distinct structures and functions that serve the organism as a whole.</p> <p><u>Teacher Note:</u> This SE is moved to 7th grade in the new TEKS and is much more clearly described. It should be sufficient to identify the levels of organization and differentiation of cells within different tissues.</p>	
<p>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</p> <p>6.3C Represent the natural world using models and identify their limitations</p>	<p>Such as:</p> <p>--- Conceptual</p> <ul style="list-style-type: none"> • Cell Theory • Scientific Method <p>--- Mathematical</p> <ul style="list-style-type: none"> • Graphs to make predictions <p>--- Physical</p> <ul style="list-style-type: none"> • Plant/ Animal Cells (use models to demonstrate/discuss cell theory, do not create models as an activity) <p><u>Teacher Note:</u> Use models to represent aspects of the natural world and identify advantages and limitations of models such as size, scale, properties, and materials.</p>	<p>Create a graphic organizer that shows the Domains and Kingdoms.</p> <p>Create a graphic organizer that shows the parts of the cell theory http://burtonbiology.com/cells/characteristicslivingthings.pdf</p>
<p>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</p> <p>6.3D Evaluate the impact of research on scientific thought, society, and the environment.</p>	<p>Such as:</p> <p>--- Current events relating to cell theory</p>	
<p>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</p> <p>6.3E Connect Grade 6 science concepts with the history of science and contributions of scientists.</p>	<p>Such as:</p> <p>--- Hooke</p> <p>---Leeuwenhoek</p>	
<p>6.4 Knows how to use a variety of tools and methods to conduct science inquiry.</p> <p>6.4A Collect, analyze, and record information using tools including beakers, petri dishes, meter sticks, graduated cylinders, weather instruments, timing devices, hot plates, test tubes, safety goggles, spring scales, magnets, balances, microscopes, telescopes, thermometers, calculators, field equipment, compasses, computers, and computer probes.</p>	<p>Including:</p> <p>--- Journals/notebooks</p> <p>--- Data collection tools as appropriate</p> <p><u>Teacher Note:</u> use appropriate tools to collect, record, and analyze information, including journals/notebooks, beakers, Petri dishes, meter sticks, graduated cylinders, hot plates, test tubes, triple beam balances, microscopes, thermometers, calculators, computers, timing devices, and other equipment as needed to teach the curriculum.</p>	

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<p>6.4 Knows how to use a variety of tools and methods to conduct science inquiry.</p> <p>6.4B Identify patterns in collected information using percent, average, range, and frequency.</p>	<p>Including: --- Use descriptive statistics including frequency, range, mean, median, and mode</p> <p>Teacher Note: Data needs to be in metric system and decimals rather than fractions.</p>	
<p>6.5 The student knows that systems may combine with other systems to form a larger system.</p> <p>6.5A Identify and describe a system that results from the combination of two or more systems.</p>	<p>Such as: --- Systems:</p> <ul style="list-style-type: none"> • Cells combine to make an organism (larger system) 	<p>http://www.usoe.k12.ut.us/curr/Science/sciber00/7th/cells/sciber/levelorg.htm Organization of Living Things</p>
<p>6.5 The student knows that systems may combine with other systems to form a larger system.</p> <p>6.5B Describe how the properties of a system are different from the properties of its parts.</p>	<p>Including: --- Systems -properties of parts and properties of whole:</p> <ul style="list-style-type: none"> • Parts of the Cell Theory • Classification of Organisms 	