


Sixth Grade Science Curriculum Bundle # 4

Title		Suggested Dates
Matter		October 26-November 13 (12 days)

Big Idea/Enduring Understanding	Guiding Questions
Properties of matter can be used to classify substances.	<p>How do matter and energy relate to the periodic table?</p> <p>How a chemical change be identified?</p> <p>How is energy involved in chemical changes?</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>6.8 The student knows that complex interactions occur between matter and energy.</p> <p>6.8A Define matter and energy.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Phase changes <ul style="list-style-type: none"> • Solid, liquid, gas, plasma --- Relate force to particle movement in phase changes --- Conservation of matter --- Differentiate between elements & compounds --- Identify equilibrium in a compound (chemical formula) <p>Teacher Note: <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>Vocabulary: matter, phase changes, elements, compounds, metals, nonmetals, metalloids, Periodic Table, physical properties, chemical properties, physical changes, chemical changes, chemical symbol, chemical formula</p> <p>AVID Activity- Writing in Science pages 22-23 “Pre-write and Quickwrite”</p> <p>Must conduct some introductory labs on measuring length, Mass and Volume</p> <p>Define Matter Lab Station pg. TE 10-11SE pages 8-9 (Region 4-Gateways to Science Grade 6)</p> <p>www.chem4kids.com (includes Matter, Elements, and Periodic Table)</p> <p>Uncovering Student Ideas in Science, Keeley, Vol. 4, #1, Sugar Water</p>

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<p>6.7 The student knows that substances have physical and chemical properties.</p> <p>6.7A Demonstrate that new substances can be made when two or more substances are chemically combined and compare the properties of the new substances to the original substances.</p>	<p>Including:</p> <p>--- Compare properties of substances before and after chemical changes</p> <ul style="list-style-type: none"> • Rusting of metal • Burning of sugar • Baking a cake • Souring of milk <p>---Evidence of new substances</p> <ul style="list-style-type: none"> • Production of a gas • Change in temperature • Production of a precipitate • Color change. • Production of odor <p><u>Teacher Note:</u> Help students identify the energy transformations occurring in phase changes and how the system reaches equilibrium.</p>	<p>Concept Map p. TE41 (Region 4-Gateways to Science Grade 6)</p> <p>Technology: Students will use Inspiration to show the relationship between Physical and Chemical Properties/Changes.</p>
<p>6.7 The student knows that substances have physical and chemical properties.</p> <p>6.7B Classify substances by their physical and chemical properties.</p>	<p>Including:</p> <p>--- Physical properties</p> <ul style="list-style-type: none"> • Color • Shape • Texture • Density • Hardness • Melting point • Boiling point • Solubility • Luster • Conductivity • malleability • States of matter • Properties of Periodic Table <ul style="list-style-type: none"> ○ Metals, non-metals, & metalloids • Properties of rocks & minerals <ul style="list-style-type: none"> ○ Hardness, color, luster, & streak <p>--- Chemical properties:</p> <ul style="list-style-type: none"> • Reactivity/No reactivity • Flammability (burns) • Oxidation <ul style="list-style-type: none"> ○ Rust 	<p>-Chemical Properties Lab pg. TE 36-37 (Region 4-Gateways to Science Grade 6)</p> <p>-Classifying Powders by Chemical/Physical Properties pg. TE 41 (Region 4-Gateways to Science Grade 6)—similar to “White Before Your Eyes” Lab pg. 52 (Holt-Holt Science & Technology Grade 6)—relate either lab to the concept map from TEK 6.7A</p> <p><u>Uncovering Student Ideas in Science</u>, Keeley, Vol. 4, #2, “Iron Bar”</p>

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	<ul style="list-style-type: none"> ○ Tarnish <p><u>Teacher Note:</u> <i>Elements are classified as metals, nonmetals, and metalloids based on their physical 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><u>Including:</u></p> <ul style="list-style-type: none"> --- Chemical use and disposal --- Heat safety --- 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><u>Including:</u></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><u>Including:</u></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>

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<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 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 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 paperclip is about 1 gram, etc.)</p> <p>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>	<p>AVID Activity- Writing in Science pages 26-28 “Observation Narrative”</p>
<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> <ul style="list-style-type: none"> --- 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>
<p>6.2 Uses scientific methods during fields and laboratory investigations.</p> <p>6.2D Communicate valid conclusions.</p>	<p>Including:</p> <ul style="list-style-type: none"> --- Relate conclusion to hypothesis/problem --- Identify sources of error/ways to improve investigation --- Communicate conclusion effectively in writing 	<p>AVID Activity- Reading in Science pages 111-132 “Additional Active Reading Graphic Organizers”</p>
<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> <ul style="list-style-type: none"> --- Organization of data <ul style="list-style-type: none"> • data charts --- Graphing data-bar graph & line graph <ul style="list-style-type: none"> • label each axis with name and units • provide a descriptive title --- Identify appropriate use of different types of data representation 	

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<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: --- Product labels relating to chemistry</p> <ul style="list-style-type: none"> • Cooking surfaces • Insulation • Heating • Plastics • Other products 	
<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: --- Conceptual</p> <ul style="list-style-type: none"> • Scientific Method • Phases changes concept map • Periodic Table <p>--- Mathematical</p> <ul style="list-style-type: none"> • Graphs to make predictions <p>--- Physical</p> <ul style="list-style-type: none"> • States of matter particle arrangement model • <p><u>Teacher Note:</u> <i>Use models to represent aspects of the natural world and identify advantages and limitations of models such as size, scale, properties, and materials</i></p>	<p>Conceptual Map- Volume pg. TE 21 (Region 4-Gateways to Science Grade 6)</p> <p>Conceptual Map- Physical Properties pg. TE 16 (Region 4-Gateways to Science Grade 6)</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: --- Current events on matter</p>	<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: --- Dmitri Mendeleev-Periodic Table</p>	

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<p>6.4 Knows how to use a variety of tools and methods to conduct science inquiry.</p> <p>6.4A 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: --- Journals/notebooks --- Data collection tools as appropriate</p> <p>Teacher Note: <i>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</i></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</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"> • Periodic Table • Interaction between matter and energy in chemical reactions 	
<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>Such as: --- Systems -properties of parts and properties of whole:</p> <ul style="list-style-type: none"> • States of Matter • Periodic Table 	