


## Sixth Grade Science Bundle # 2

<b>Title</b>		<b>Suggested Dates</b>
Energy		September 14-October 2 (14 days)

<b>Big Idea/Enduring Understanding</b>	<b>Guiding Questions</b>
Energy can be transferred from one object to another. Energy can be transformed from one type to another.	What are different forms of energy and how do they apply to everyday activities? What happens to energy during a transfer (lost/ gained)? How do everyday appliances transform energy?

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.

<b>Knowledge &amp; Skills with Student Expectations</b>	<b>Specificity &amp; Examples</b>	<b>Suggested Resources</b> (Read the note above)
<p><b>6.8 The student knows that complex interactions occur between matter and energy.</b></p> <p>6.8A Define matter and energy.</p>	<p><b>Including:</b></p> <p>--- Potential &amp; kinetic energy</p> <ul style="list-style-type: none"> <li>• compare and contrast potential and kinetic energy</li> </ul> <p>--- Forms of energy</p> <ul style="list-style-type: none"> <li>• Electrical</li> <li>• Thermal</li> <li>• Light</li> <li>• Solar</li> <li>• Chemical</li> <li>• Mechanical</li> <li>• Nuclear</li> </ul> <p><u>Teacher note:</u> Focus on energy transfers and energy transformations. Explain the relationship between matter &amp; energy in unit on matter (focus just on energy here).</p>	<p><b><u>Vocabulary:</u></b> energy, potential energy, kinetic energy, thermal energy/ heat energy, chemical energy, mechanical energy, nuclear energy, light energy, solar energy, electrical energy, energy transfer, energy transformation</p> <p>AVID Activity- Writing in Science pages 22-23 “Pre-write and Quickwrite”</p> <p>Energy Swings Lab (use as demonstration) pg. 117 (Holt Science &amp; Technology)</p> <p><a href="http://www.brainpop.com">www.brainpop.com</a>; Search Energy</p> <p>All Wound Up Lab (use as demonstration) pg. 119 (Holt Science and Technology)</p> <p>Forms of Energy Lab pg. TE 48 (Region 4-Gateways to Science Grade 6)</p> <p>Journal Entry pg. SE 57 (Region 4-Gateways to Science Grade 6)</p>

## Sixth Grade Science Bundle # 2

<p><b>6.9 The student knows that obtaining, transforming, and distributing energy affects the environment.</b></p> <p>6.9A Identify energy transformations occurring during the production of energy for human use such as electrical energy to heat energy or heat energy to electrical energy.</p>	<p><b>Including:</b></p> <p>---Energy Transformations</p> <ul style="list-style-type: none"> <li>• Chemical energy to electrical energy (burning of fuels to power generators)</li> <li>• Kinetic energy to electrical energy (wind turbines)</li> <li>• Potential energy to electrical energy (hydroelectric power)</li> <li>• Chemical energy to sound, heat, &amp; light (radio, TV, etc.)</li> </ul> <p>--- Recognize that most of the things that happen in the universe are a result of an energy transformation</p> <p>--- Understand transformations may include multi-step transformations</p> <p>---Understand energy is not lost or gain it is just transferred</p> <p><u>Teacher Note:</u> Collect information by observing</p>	<p>Core Activity- Energy Conversion Lab</p> <p>*Helpful resource- <a href="http://msteacher.org/epubs/science/science2/activities.aspx">http://msteacher.org/epubs/science/science2/activities.aspx</a></p> <p>Technology: <a href="http://my.hrw.com/nsmedia/intgos/html/igo.htm">http://my.hrw.com/nsmedia/intgos/html/igo.htm</a> Students will create a graphic organizer showing the relationships between types of energy during an energy transfer.</p>
<p><b>6.9 The student knows that obtaining, transforming, and distributing energy affects the environment.</b></p> <p>6.9B Compare methods used for transforming energy in devices such as water heaters, cooling systems, or hydroelectric and wind power plants.</p>	<p><u>Teacher note:</u> Compare (similarities &amp; differences) between the devices listed on 6.9B.</p>	<p><a href="http://www.brainpop.com">www.brainpop.com</a> ; search Refrigerator</p> <p>-Have students create a diagram to include Hot water heating system, warm air heating system, active/passive solar heating system, and refrigerator. Be sure to have students compare/ contrast between the devices.</p>
<p><b>6.9 The student knows that obtaining, transforming, and distributing energy affects the environment.</b></p> <p>6.9C Research and describe energy types from their source to their use and determine if the type is renewable, non-renewable, or inexhaustible.</p>	<p>--- Classify energy sources as renewable, nonrenewable, or inexhaustible</p> <p>--- Describe how these sources of energy are used</p> <p><u>Teacher Note:</u> Include 6.1B (recycling of lab materials)</p>	<p>Technology- Create a Brochure using Microsoft Publisher</p>
<p><b>6.1 Conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices.</b></p> <p>6.1A Demonstrate safe practices during field and laboratory investigations.</p>	<p><b>Including:</b></p> <p>--- Chemical use and disposal</p> <p>--- Electrical &amp; heat safety</p> <p>--- Safe practices with lab equipment</p> <p>--- Implement District Safety Contract</p> <p>--- Operate in accordance with the Texas Safety Standards</p> <p><u>Teacher Note:</u> Safety skills and process TEKS should be embedded and reinforced throughout the year.</p>	<p><a href="#">Texas Safety Standards</a></p>

## Sixth Grade Science Bundle # 2

<p><b>6.1 Conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices.</b></p> <p>6.1B Make wise choices in the use and conservation of resources and the disposal and recycling of materials.</p>	<p><b>Including:</b>          --- Recycle lab material</p>	
<p><b>6.2 Uses scientific methods during fields and laboratory investigations.</b></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><b>Including:</b>          --- Independent and dependent variables          --- Controls          --- Procedures          --- Materials          --- Using a standard lab report format</p> <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>Emphasize Observation skills and organizing data during the Energy Transformation Lab.</p> <p>AVID Activity- Writing in Science pages 55-94          “Experimental Design Lab Report Activities”</p>
<p><b>6.2 Uses scientific methods during fields and laboratory investigations.</b></p> <p>6.2B Collect information by observing and measuring.</p>	<p><b>Including:</b>          --- Collecting information using the metric system         <ul style="list-style-type: none"> <li>• Introduce metric system</li> </ul>         --- Pre-AP: Emphasis on using probeware in a variety of situations</p> <p><u>Teacher Note:</u> New TEK 2010-2011-Collect and record data using the International System of Units (SI) and qualitative means, such as label drawings, writing, and graphic organizers.</p>	<p>Emphasize Qualitative Observation skills and organizing data during the Energy Transformation Lab. May include labeled drawings or graphic organizers</p> <p>AVID Activity- Writing in Science pages 26-28          “Observation Narrative”</p>
<p><b>6.2 Uses scientific methods during fields and laboratory investigations.</b></p> <p>6.2C Analyze and interpret information to construct reasonable explanations from direct and indirect evidence.</p>	<p><b>Including:</b>          --- Look for trends and/or patterns specific in the data and/or graph</p>	<p>AVID Activity- Writing in Science pages 29-30          “Comparative Analysis”</p>
<p><b>6.2 Uses scientific methods during fields and laboratory investigations.</b></p> <p>6.2D Communicate valid conclusions.</p>	<p><b>Including:</b>          --- Relate conclusion to hypothesis/problem          --- Identify sources of error/ways to improve investigation          --- Communicate conclusion effectively in writing</p>	<p>AVID Activity- Reading in Science pages 111-132          “Additional Active Reading Graphic Organizers”</p>
<p><b>6.2 Uses scientific methods during fields and laboratory investigations.</b></p> <p>6.2E Construct simple graphs, tables, maps, and charts using tools including computers to organize, examine and evaluate data.</p>	<p><b>Including:</b>          --- Organization of data         <ul style="list-style-type: none"> <li>• data charts</li> </ul>         --- Graphing data-bar graph &amp; line graph         <ul style="list-style-type: none"> <li>• label each axis with name and units</li> <li>• provide a descriptive title</li> </ul> </p>	

## Sixth Grade Science Bundle # 2

	<p>identify appropriate use of different types of data representation</p> <p><u>Teacher Note:</u> Emphasize the nature of scientific explanations: testability, repeatability, evidence, predictive nature.</p>	
<p><b>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</b></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><b>6.3B</b> Draw inferences based on information related to promotional materials for products and services.</p>	<p>Such as:</p> <ul style="list-style-type: none"> <li>--- Product labels relating to energy conservation &amp; consumption             <ul style="list-style-type: none"> <li>• Energy labels on devices (washer, dryer, etc.)</li> <li>• Advertisements for solar, wind, hydro, etc. power</li> </ul> </li> <li>“Green” household chemical labels</li> </ul>	
<p><b>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</b></p> <p>6.3C Represent the natural world using models and identify their limitations.</p>	<p>Including:</p> <ul style="list-style-type: none"> <li>--- Conceptual             <ul style="list-style-type: none"> <li>• Scientific Method</li> </ul> </li> <li>--- Mathematical             <ul style="list-style-type: none"> <li>• Graphs to make predictions</li> </ul> </li> <li>--- Physical             <ul style="list-style-type: none"> <li>• Energy Devices</li> </ul> </li> </ul> <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>-Include limitations/ advantages of the diagrams of the heating and cooling systems in TEK 6.9B</p>
<p><b>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</b></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"> <li>--- Current event on energy production/ use, energy conservation</li> </ul>	<p><u>AVID Activity:</u> Writing in Science page 24 “Brief Autobiography”.</p>
<p><b>6.3 Uses critical thinking and scientific problem solving to make informed decisions.</b></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"> <li>--- Einstein</li> <li>---Jean Joseph Etienne- inventor of the 1<sup>st</sup> practical combustion engine</li> </ul>	

## Sixth Grade Science Bundle # 2

<p><b>6.4 Knows how to use a variety of tools and methods to conduct science inquiry.</b></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><b>Including:</b></p> <ul style="list-style-type: none"><li>--- Journals/notebooks</li><li>--- Data collection tools as appropriate</li></ul>	
<p><b>6.4 Knows how to use a variety of tools and methods to conduct science inquiry.</b></p> <p>6.4B Identify patterns in collected information using percent, average, range, and frequency.</p>	<p><b>Including:</b></p> <ul style="list-style-type: none"><li>--- Use descriptive statistics including frequency, range, mean, median, and mode</li></ul> <p><u>Teacher Note:</u> Data needs to be in metric system and decimals rather than fractions.</p>	