


## 2nd Grade - Elementary Science Bundle # 11

Title	Suggested Dates
Energy & Motion 	4/19/10 – 5/7/10 (15 days)

Big Idea/Enduring Understanding	Guiding Questions
Energy can cause objects to move.	<p>How will the position of an object change due to a force being applied?</p> <p>How will the amount of force applied change the position of an object?</p> <p>How can a magnet change the position of an object?</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	District Specificity/Examples	Suggested Resources (See note above)
<p><b>NEW TEKS:</b>  <b>2.6 Force, motion, and energy. The student knows that forces cause change and energy exists in many forms.</b></p> <p>2.6c trace the changes in the position of an object over time such as a cup rolling on the floor and a car rolling down a ramp</p> <p>2.6d compare patterns of movement of objects such as sliding, rolling, and spinning</p> <p><b>CURRENT TEKS</b>  <b>2.7 The student knows that many types of change occur.</b>                      2.7c demonstrate a change in the motion of an object by giving the object a push or a pull</p>	<p><b>Demonstrate with a variety of toys (tops or model cars) what happens when</b></p> <ul style="list-style-type: none"> <li>○ Pushed</li> <li>○ Pulled</li> <li>○ Released on a slope - gravity</li> <li>○ Left alone</li> <li>○ Magnetism as a push or pull</li> </ul> <p>This may be a good time to discuss Robert Fulton and the development of the steam engine to integrate S.S. TEKS 2.4b.</p> <p>Use common age-appropriate examples: soccer, kick-ball, T-ball, swings, seesaws, rakes, brooms, shovels, toys (cars, yo-yo, etc).</p> <p><b>MUST BE HANDS ON!!</b> Go to the playground or in the classroom and have the students find examples of pushes and pulls. Create a chart to list findings.</p> <p>Ex. Using a soccer ball, have a student kick the ball by bringing their foot all the way back. Measure. Then have the same student kick the ball while keeping their knees together. Measure. Using different types of kicks...observe and document patterns of movement.</p>	<p>Resources applied to the entire bundle:</p> <p><a href="#">Science Notebooks</a></p> <p>IF I TRY (Intranet)</p> <p><a href="#">KLEW/ Claims &amp; Evidence</a></p> <p><a href="#">PISD Elem Science Homepage</a></p> <p>PISD K-5 Equipment Alignment</p> <p><a href="#">TAKScopes</a></p> <p>FOSS - Balance and Motion Delta Education <a href="http://www.FOSSweb.com">www.FOSSweb.com</a></p> <p><a href="#">United Streaming</a> How Things Move TLC Elementary School: Rules of Motion and Forces Facts About Forces Laws of Motion</p> <p><a href="#">AIMS 2<sup>nd</sup> Grade Texas Core Curriculum</a> <a href="#">Physical Science Book</a> Push 'n' Pull Antics Pushed Around</p>
<p><b>CURRENT TEKS</b>  <b>2.7 The student knows that many types of change occur.</b></p>	<p><b>Including</b></p> <ul style="list-style-type: none"> <li>● Size –for example: ruler, unifix cubes</li> <li>● Mass – for example: primary balance, double pan</li> </ul>	<p><a href="#">Physical Science Book</a> Push 'n' Pull Antics Pushed Around</p>

## 2nd Grade - Elementary Science Bundle # 11

<p>2.7a observe, measure, record, analyze, predict, and illustrate changes in size, mass, temperature, color, position, quantity, sound, and movement</p>	<p style="text-align: center;">balance</p> <ul style="list-style-type: none"> <li>• Temperature – Celsius thermometer</li> <li>• Color –for example: shades, tint, and primary colors</li> <li>• Position –for example: right, left, up, down, under</li> <li>• Quantity – for example: number</li> <li>• Sound             <ul style="list-style-type: none"> <li>○ Volume- Loudness</li> <li>○ Pitch</li> <li>○ Vibration</li> </ul> </li> <li>• Movement – forward / backward / side to side/ up and down/ spinning</li> </ul>	<p>Lid Skid Puffer Paths Finding Forces</p> <p>Net Trekker</p> <ul style="list-style-type: none"> <li>• <u>Pushing and Pulling:</u> <a href="http://www.ngfl-cymru.org.uk/vtc/push_pull/eng/Introduction/InteractiveWhiteboardActivity.htm">http://www.ngfl-cymru.org.uk/vtc/push_pull/eng/Introduction/InteractiveWhiteboardActivity.htm</a></li> <li>• <u>BBC: Friction:</u> <a href="http://www.bbc.co.uk/schools/ks2bitesize/science/activities/friction.shtml">http://www.bbc.co.uk/schools/ks2bitesize/science/activities/friction.shtml</a></li> <li>• <u>Forces and Movement:</u> <a href="http://www.bbc.co.uk/schools/scienceclips/ages/6_7/forces_movement.shtml">http://www.bbc.co.uk/schools/scienceclips/ages/6_7/forces_movement.shtml</a></li> </ul>
<p><b>NEW TEKS:</b> <b>2.5 Matter and energy. The student knows that matter has physical properties and those properties determine how it is described, classified, changed, and used.</b></p> <p>2.5d combine materials that when put together can do things that they cannot do by themselves such as building a tower or a bridge and justify the selection of those materials based on their physical properties</p> <p><b>CURRENT TEKS</b> <b>2.6 The student knows that systems have parts and are composed of organisms and objects.</b> 2.6a manipulate, predict, and identify parts that, when separated from the whole, may result in the part or the whole not working, such as a flashlight without batteries and a plant without leaves 2.6b manipulate, predict, and identify parts that, when put together, can do things they cannot do by themselves, such as a guitar and guitar strings</p>	<p>How does removing a part from the system change its pattern of movement?</p> <ul style="list-style-type: none"> <li>• Such as: missing parts of model cars, missing parts of plants/animals and its function.</li> <li>• Students must predict what will happen if parts are removed or stop working-</li> <li>• Teacher demonstration of consequences of removal of a part or non-functioning – such as removing a chain from a swing and observe</li> </ul> <p><b>TEACHER NOTE:</b> relate to <u>any moving thing</u> that has parts and “what would happen” – however, guitar strings works well with sound energy</p> <p>Integrate TEKS when discussing any system or tool such as plants, animals, balance, hand lens, etc Combine objects to create a new system such as: building a model car/mouse trap/rockets.</p>	
<p><b>CURRENT TEKS</b> <b>2.5 The student knows that organisms, objects, and events have properties and patterns.</b></p> <p>2.5b identify, predict, replicate, and create patterns including those seen in charts, graphs, and numbers</p>	<p>Whenever possible do both charts and graphs.</p> <p>REPLICATE using different materials such as: picture cards, dictation, yarn/string, math manipulatives, paperclips, clay, labeled drawings, science notebooks.</p> <p><b>TEACHER NOTE:</b> Combine with Math TEKS to use the same types of graphs in both subjects.</p>	

## 2nd Grade - Elementary Science Bundle # 11

<p><b>NEW TEKS:</b>  <b>2.1 Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures.</b></p> <p>2.1a identify and demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including wearing safety goggles, washing hands, and using materials appropriately</p> <p>2.1b describe the importance of safe practices</p> <p>2.1c identify and demonstrate how to use, conserve, and dispose of natural resources and materials such as conserving water and reuse or recycling of paper, plastic, and metal</p> <p><b>CURRENT TEKS</b>  <b>2.1 Scientific processes. The student conducts classroom and field investigations following home and school safety procedures.</b></p> <p>2.1a demonstrate safe practices during classroom and field investigations</p> <p>2.1b learn how to use and conserve resources and dispose of materials</p>	<p>No tasting or touching unless instructed          Safe smelling – wafting          Goggles          Wait for teacher directions          No glassware          Students do not handle hot water, hot plates or burners.          Washing hands after science activities</p> <p>Review investigation safety procedures [directly point out precautions, possible safety risks, specific guidelines for the lesson] for both indoor and outdoor activities, as applicable. In addition, encourage students to identify these on their own throughout the year [document in science notebooks via words and/or pictures]</p> <p><b>TEACHER NOTE:</b> When possible, return natural items to their environment (i.e. rocks back to garden)</p> <p>Make note of and teach use of district-wide recycling resource.</p>	<p><a href="#">PISD Safety Website</a>          -Safety Contracts, games, etc          -Science Safety is Elementary (for teachers)          -Safety in the Elementary Classroom (for teachers)</p> <p><a href="#">DuPont Science Safety Zone website</a></p> <p><a href="#">Texas Science Safety Standards</a></p>
<p><b>NEW TEKS:</b>  <b>2.2 Scientific investigation and reasoning. The student develops abilities necessary to do scientific inquiry in classroom and outdoor investigations.</b></p> <p>2.2a ask questions about organisms, objects, and events during observations and investigations</p> <p>2.2b plan and conduct descriptive investigations such as how organisms grow</p> <p>2.2c collect data from observations using simple equipment such as hand lenses, primary balances,</p>	<p>Should be modeled and guided by teacher – Think-Aloud technique          Should be oral and/or written          Should occur both indoors and outdoors.</p> <p>Tools and equipment, including senses, should be used in authentic learning settings including during an outside field investigation</p> <p>Communicate both verbally and in science notebook (pictures, words, copying information from class discussion and teacher modeled big book science notebook entry)</p> <p>Develop questions using resources such as Science Notebooks,</p>	

## 2nd Grade - Elementary Science Bundle # 11

<p>thermometers, and non-standard measurement tools</p> <p>2.2d record and organize data using pictures, numbers, and words</p> <p>2.2e communicate observations and justify explanations using student-generated data from simple descriptive investigations</p> <p>2.2f compare results of investigations with what students and scientists know about the world</p> <p><b>CURRENT TEKS</b></p> <p><b>2.2 Scientific processes. The student develops abilities necessary to do scientific inquiry in the field and the classroom.</b></p> <p>2.2a ask questions about organisms, objects, and events</p> <p>2.2b plan and conduct simple descriptive investigations</p> <p>2.2d gather information using simple equipment and tools to extend the senses</p> <p>2.2e construct reasonable explanations and draw conclusions using information and prior knowledge</p> <p>2.2f communicate explanations about investigations</p> <p>2.2c compare results of investigations with what students and scientists know about the world</p>	<p><b>KLEW charts and students sharing with one another</b></p> <p>Class discussion of observations is a critical element to allow students to elaborate and build understanding</p> <p>Model student recording of data (pictures, words) – with more support initially as students copy information compiled in class discussion by the teacher on a chart.</p> <p>Include a mini-lesson, as appropriate to model the use of a chosen graphic organizer as a tool to record data and enter into science notebooks</p>	
<p><b>NEW TEKS:</b></p> <p><b>2.3 Scientific investigation and reasoning. The student knows that information and critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions.</b></p> <p>2.3a identify and explain a problem in his/her own words and propose a task and solution for the problem such as lack of water in a habitat</p> <p>2.3b make predictions based on observable patterns</p> <p>2.3c identify what a scientist is and explore what</p>	<p>Introduce the fact that you can solve a problem or answer a question <u>through a systematic approach</u></p> <p>Model using the Think-Aloud technique (processes and steps to decision-making)</p> <p>The key here is to support students as they observe the world and the results of their investigations and build their critical thinking by looking at those results as evidence that supports a concept.</p> <p>Use the KLEW graphic organizer to support this process.</p> <p>Use reflective discussions to develop and answer questions about the scientific concepts studied. Student entries should be</p>	

## 2nd Grade - Elementary Science Bundle # 11

<p>different scientists do</p> <p>CURRENT TEKS  <b>2.3 Scientific processes. The student knows that information and critical thinking are used in making decisions.</b>                  2.3c explain a problem in his/her own words and identify a task and solution related to the problem                  2.3a make decisions using information                  2.3b discuss and justify the merits of decisions</p>	<p>their elaboration based on class discussion:</p> <p>Student should use their Science Notebooks and one another as a reference, a resource and a place to record ideas, learning, questions, etc.</p>	
<p>NEW TEKS:  <b>2.4 Scientific investigation and reasoning. The student uses age-appropriate tools and models to investigate the natural world.</b></p> <p>2.4a collect, record, and compare information using tools, including computers, hand lenses, rulers, primary balances, plastic beakers, magnets, collecting nets, notebooks, and safety goggles; timing devices, including clocks and stopwatches; weather instruments such as thermometers, wind vanes, and rain gauges; and materials to support observations of habitats of organisms such as terrariums and aquariums</p> <p>2.4b measure and compare organisms and objects using non-standard units that approximate metric units</p> <p>CURRENT TEKS  <b>2.4 Scientific processes. The student uses age-appropriate tools and models to verify that organisms and objects and parts of organisms and objects can be observed, described, and measured.</b>                  2.4a collect information using tools including rulers, meter sticks, measuring cups, clocks, hand lenses, computers, thermometers, and balances                  2.4b measure and compare organisms and objects and parts of organisms and objects, using standard and nonstandard units</p>	<p>Tools that support hands-on investigation must be taught, modeled, guided and used.</p> <p>Students will use science notebooks to record information and draw pictures of shadows, etc. Science notebooks need to be set-up early in the bundle to allow proper use. This should not be the initial lesson on notebook entries.</p> <p>Linear measurement using non-standard units of measure using pictures and shadows of different objects.</p> <p>Additional tools should be utilized as appropriate (i.e. digital cameras for documentation, pictures of primary source (shadows))</p>	