

2nd Grade - Elementary Science Bundle # 2

Title	Suggested Dates
Shadows and the Moon	9/14/09 – 10/02/09 (14 days)



Big Idea/Enduring Understanding	Guiding Questions
There are predictable patterns in the natural world, including shadows and moon phases.	<p>How do you explain the changes in our shadows throughout the day and year?</p> <p>How can you apply your knowledge of patterns to explain the appearance of the moon in the night sky?</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>NEW TEKS: 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.</p> <p>2.5a classify matter by physical properties, including shape, relative mass, relative temperature, texture, flexibility, and whether material is a solid or liquid</p> <p>CURRENT TEKS 2.5 Science concepts. The student knows that organisms, objects, and events have properties and patterns.</p> <p>2.5a classify and sequence organisms, objects, and events based on properties and patterns</p> <p>NEW TEKS: 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.</p> <p>2.5c demonstrate that things can be done to</p>	<p>The explorations in “Me and My Shadow” (Bridging to TAKS Light & Optics) allow students to study what happens when light hits objects</p> <ul style="list-style-type: none"> • Variety of objects • Different times of day • Object made from a variety of materials • Objects that move <p>Observations are made both indoors and outdoors.</p> <p>Students look at differences in shadows and in the amount of light that can be seen through different materials</p> <p>Can include observations that allow students to classify objects based on:</p> <p>Darkness of shadow Length of shadow How light passes through a variety of solids and liquids</p>	<p>Resources listed here apply to the entire bundle.</p> <p>Science Notebooks</p> <p>IF I TRY (Intranet)</p> <p>KLEW/ Claims & Evidence</p> <p>PISD Elem Science Homepage</p> <p>PISD Safety Website -Safety Contracts, games, etc -Science Safety is Elementary (for teachers) -Safety in the Elementary Classroom (for teachers)</p> <p>DuPont Science Safety Zone website</p> <p>Texas Science Safety Standards</p> <p>PISD K-5 Equipment Alignment</p> <p style="text-align: center;">REQUIRED GRADE LEVEL SIGNATURE RESOURCE</p> <p>BIITAKS Light and Optics “Me and My Shadow”</p>

2nd Grade - Elementary Science Bundle # 2

<p>materials to change their physical properties such as cutting, folding, sanding, and melting</p> <p>CURRENT TEKS 2.7 Science concepts. The student knows that many types of change occur. 2.7a observe, measure, record, analyze, predict, and illustrate changes in size, mass, temperature, color, position, quantity, sound, and movement</p>		<p>(1 to 2 weeks in length). Master copies of lessons are in every elementary campus library. Every campus has the kits.</p> <p>Brain Pop Jr. “Earth” “The Moon”</p> <p>United Streaming “A Closer Look at Space: The Moon” “Junior Space Scientist: Voyage to the Moon” “Science Facts and Fun: What’s in a Shadow” “Peep and the Big Wide World: Quack and the Very Big Rock/Shadow Play” “The Blue Dragon: Shadow Play”</p> <p>AIMS 2nd Grade Texas Core Curriculum – Earth Science Book “Look at the Moon”</p>
<p>NEW TEKS: 2.8 Earth and space. The student knows that there are recognizable patterns in the natural world and among objects in the sky.</p> <p>2.8a measure, record, and graph weather information including temperature, wind conditions, precipitation, and cloud coverage, in order to identify patterns in the data</p> <p>CURRENT TEKS 2.7 Science concepts. The student knows that many types of change occur. 2.7a observe, measure, record, analyze, predict, and illustrate changes in size, mass, temperature, color, position, quantity, sound, and movement 2.7d observe, measure, and record changes in weather, the night sky, and seasons</p>	<p>These TEKS connect with the process skills in 2.2 – 2.4</p> <p>Require teacher modeling and support</p> <ul style="list-style-type: none"> • Initial recording modeled in whole group setting • Develop skills in using weather instruments <ul style="list-style-type: none"> ○ Rain gauge ○ Thermometer ○ Wind Sock 	
<p>NEW TEKS: 2.8 Earth and space. The student knows that there are recognizable patterns in the natural world and among objects in the sky.</p>	<p>Observation of changes in the moon’s appearance can be supported with authentic observations – recorded by students at school and at home; and through technology – sites that show the phase of the moon for the current day. Use this data to create a simple pictorial log of the phase changes – a</p>	

2nd Grade - Elementary Science Bundle # 2

<p>2.8d observe, describe, and record patterns of objects in the sky, including the appearance of the moon</p>	<p>large calendar type chart for the whole class to observe Students could transfer drawings into their notebooks every few days – with an emphasis that even though we are drawing only a few of the actual “phases” – these changes occur gradually over time</p> <p>*This is a great time to use a lamp and Styrofoam moon models to illustrate how these changes are actually caused by the way we see the Sun’s light reflecting off of the moon</p> <p>BIG MISCONCEPTION: The phases are not caused by the shadow of the Earth on the Moon. The amount of the lighted side of the Moon that we can see changes as the Earth’s position in relation to the Moon changes during the month.</p>	
<p>NEW TEKS: 2.1 Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures.</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 2.1b describe the importance of safe practices</p> <p>CURRENT TEKS 2.1 Scientific processes. The student conducts classroom and field investigations following home and school safety procedures. 2.1a demonstrate safe practices during classroom and field investigations 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>Do not look directly at Sun</p>	
<p>NEW TEKS: 2.1 Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures.</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</p>	<p>TEACHER NOTE: 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>	

2nd Grade - Elementary Science Bundle # 2

<p>recycling of paper, plastic, and metal</p> <p>NEW TEKS: 2.2 Scientific investigation and reasoning. The student develops abilities necessary to do scientific inquiry in classroom and outdoor investigations.</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, 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>CURRENT TEKS 2.2 Scientific processes. The student develops abilities necessary to do scientific inquiry in the field and the classroom.</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</p>	<p>Should be modeled and guided by teacher – Think-Aloud technique Should be oral and/or written Should occur both indoors and outdoors. Tools and equipment, including senses, should be used in authentic learning settings including during an outside field investigation</p> <p>As the year progresses, more natural and authentic use of notebooks before, during, and after lessons/investigations/activities should be integrated (in “science” and other applicable connections throughout the day).</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, KLEW charts and students sharing with one another EX: How does the shadow of the school flagpole change during the day?</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>	
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2nd Grade - Elementary Science Bundle # 2

<p>investigations 2.2c compare results of investigations with what students and scientists know about the world</p>		
<p>NEW TEKS: 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.</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 different scientists do</p> <p>CURRENT TEKS 2.3 Scientific processes. The student knows that information and critical thinking are used in making decisions.</p> <p>2.3c explain a problem in his/her own words and identify a task and solution related to the problem</p> <p>2.3a make decisions using information</p> <p>2.3b discuss and justify the merits of decisions</p>	<p>Introduce the fact that you can solve a problem or answer a question <u>through a systematic approach</u>. This is not necessarily “the Scientific Method”, but simply an organized approach to problem-solving.</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 their elaboration based on class discussion:</p> <p>EX of Critical Questioning (Decision making/ Problem Solving): Based on our investigations - What is the best type of material to use as a curtain if I want my room to be dark during the day?</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: 2.4 Scientific investigation and reasoning. The student uses age-appropriate tools and models to investigate the natural world.</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>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.</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>	

2nd Grade - Elementary Science Bundle # 2

<p>2.4b measure and compare organisms and objects using non-standard units that approximate metric units</p> <p>CURRENT TEKS 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.</p> <p>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><i>NEW TEKS:</i> 2.8 Earth and space. The student knows that there are recognizable patterns in the natural world and among objects in the sky.</p> <p><i>2.8a measure, record, and graph weather information including temperature, wind conditions, precipitation, and cloud coverage, in order to identify patterns in the data</i></p> <p>CURRENT TEKS 2.7 Science concepts. The student knows that many types of change occur. <i>2.7d observe, measure, and record changes in weather, the night sky, and seasons</i></p>	<p><i>Keep daily weather log (as part of morning weather / calendar routine).</i></p> <p><i>This models and provides experience gathering and recording data over time. The data will be used during Bundle 3 when there is more of a direct focus on weather.</i></p>	