

3rd Grade - Elementary Science Bundle # 2

Title	Suggested Dates
Space & Weather	9/14/09 – 10/02/09 (14 days)



Big Idea/Enduring Understanding	Guiding Questions
The sun is the essential component for energy in our solar system.	<p>Why does the water cycle need the sun?</p> <p>What are some limitations of a model of the solar system?</p> <p>How does the sun impact the weather?</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: 3.8 Earth and Space. The student knows there are recognizable patterns in the natural world and among objects in the sky.</p> <p>3.8b – describe and illustrate that the Sun as a star composed of gases that provides light and heat energy for the water cycle</p> <p>CURRENT TEKS 3.11 Science concepts. The student knows that the natural world includes earth materials and objects in the sky. 3.11d describe the characteristics of the Sun</p>	<p style="color: red;">Emphasize the composition of the Sun (ball of hot gases) as it relates to producing heat and light energy</p> <p style="color: red;">Key concepts:</p> <ul style="list-style-type: none"> <li style="color: red;">• Size of the sun in comparison to the Earth and planets: <ul style="list-style-type: none"> <li style="color: red;">○ TAKScopes Engage – balloon Sun and bead Earth <li style="color: red;">○ Bridging II TAKS: Elaborate section #5 and #6 (p 13 - 14) Sun/Earth paper scale models of size and distance apart <li style="color: red;">• Sun as source of heat and light energy <ul style="list-style-type: none"> <li style="color: red;">○ Bridging II TAKS: Explain section – radiation can activity <li style="color: red;">• Position and movement – see new TEK 3.8b below <p style="color: red;">TEKS are no longer emphasizing these specific characteristics, such as sun spots, solar flares and prominences</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 K-5 Equipment Alignment</p> <p style="text-align: center;">REQUIRED GRADE LEVEL SIGNATURE RESOURCE</p> <p>Bridging to TAKS – Light & Optics “Star Power” Master Copies of lessons are in campus library. Every campus has the kit.</p> <p>TAKScopes - The Sun's Characteristics (3.11D)</p> <ul style="list-style-type: none"> • Skip Explore section - making a clay

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		<p>model of layers of the Sun – this concept not a TEK</p> <ul style="list-style-type: none"> • Skip the swirling colors “sunspot” activity – also not a TEK <p>Space Place - NASA Space Place - Spanish</p> <p>BrainPOP Jr.: “Water Cycle”</p> <p>Elementary Globe: “Measure Up” p. 3, “Further Investigations, Measurements in Nature”</p>
<p>NEW TEKS: 3.8 Earth and Space. The student knows there are recognizable patterns in the natural world and among objects in the sky.</p> <p>3.8c – construct models that demonstrate the relationship of the Sun, Earth, and Moon, including orbits and positions</p>	<p>2nd Gr. observes patterns of change in objects in the sky (including the moon)</p> <p>3rd grade focus: <u>build the foundation</u> - understand the positions and movements of the Moon and Earth in relation to the Sun. Experience several models of the system</p> <p>4th and 5th make causal connections between movements and the seasons, moon phases, day and night and the Sun’s apparent movement across the sky.</p> <p>Use models to introduce vocabulary: Focus on interchangeable use and illustration of the vocabulary: revolve/revolution/orbit because these are the movements in the model</p>	<p>Include a variety of models – including students as Sun/ Earth/ Moon</p> <p>AIMS 3rd Grade Texas Core Curriculum Earth Science Book “Sizing Up the Sun” pp. 35-39</p> <p>United Streaming: A Closer Look at the Sun: “Relationship with Earth”</p>
<p>NEW TEKS: 3.8 Earth and Space. The student knows there are recognizable patterns in the natural world and among objects in the sky.</p> <p>3.8d – identify the planets in Earth's solar system and their position in relation to the Sun</p> <p>CURRENT TEKS 3.11 Science concepts. The student knows that the natural world includes earth materials and objects in the sky. 3.11c identify the planets in our solar system and their position in relation to the Sun</p>	<p>Focus: position and movement (revolution) of the planets in relationship to the Sun.</p> <p>Important: show at least 3 different models of the Solar System - where each model shows a different important characteristic of the system. At least one of these models should be student generated. Combine the ideas from all these models to form a more accurate mental model of the real solar system</p> <p>Students need to realize that because of the immense size of our Solar System – not all parts of the real system can be modeled at one time.</p> <ul style="list-style-type: none"> ○ Model showing position (planet order) puts planets in a line...which never happens in space...but is done because this model is built only to show that one aspect of the Solar System ○ Another model may show relative distance of planets from 	<p>TAKScopes Planets</p> <ul style="list-style-type: none"> • Distance Between Planets is a little video in the Internet Resources section of the Elaborate tab – would be a great engagement for this set of lessons • Explore: use copied photos (on site) to compare relative size and build model of relative distance • Model of the position of planets in the solar system – Elaborate tab – Next Step Inquiry <p>AIMS 3rd Grade Texas Core Curriculum Earth Science Book</p>

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	<p style="text-align: center;">the Sun and each other, but cannot show relative size at the same time</p> <ul style="list-style-type: none"> • Show several models – each one focuses on a different important aspect of the real solar system, AND • Discuss each model: how each is like the real system and different from the real system 	<p>“Planetary Arrangements” pp. 11-13, 24-25, 18-19 “The Spaces in Our System” pp. 20-26</p> <p>Additional models – Toilet Paper Square Distance Model, Radial Model (Sci Curr Folder in Campus Share Folder)</p> <p>AIMS 3rd Grade Texas Core Curriculum Earth Science Book “Planetary Arrangements” pp. 14-16</p> <p>Extension: <u>Elementary Science with Vernier</u>: “Distance From the Sun” - Activity 32</p>
<p>NEW TEKS: 3.8 Earth and Space. The student knows there are recognizable patterns in the natural world and among objects in the sky.</p> <p>3.8a – observe, measure, record, and compare day-to-day weather changes in different locations at the same time that include air temperature, wind direction, and precipitation</p>	<p style="background-color: yellow;">Begin weather – 3rd week of bundle</p> <p>Connect to new TEK 3.8b – the Sun provides light and heat energy for the water cycle. The water cycle has been taught in 2nd grade.</p> <p>Keep daily weather log of local weather data This models and provides experience gathering and recording data over time.</p> <p>The collected data will be used during Bundle 8</p> <p>Use mini lessons to introduce the weather tools from the list in NEW 3.4a. The wind vane used must have a directional piece or be used with a compass. The compass use would be largely teacher directed (connect to Social Studies TEK 3.5a – using cardinal and intermediate directions)</p>	<p>Weatherbug</p> <p>TAKScopes Topic: Earth Science 4th – Patterns of Change: Weather Student Journal pp. 2-3 – Weather Data Chart (eliminate Cloud Type)</p>
<p>NEW TEKS: 3.1 Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures and uses environmentally appropriate practices</p> <p>3.1a – demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including observing a schoolyard habitat</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</p>	

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<p>CURRENT TEKS 3.1 Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices 3.1a demonstrate safe practices during field and laboratory investigations.</p>	<p>identify these on their own throughout the year [document in science notebooks via words and/or pictures]</p>	
<p>NEW TEKS: 3.1 Scientific investigation and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures and uses environmentally appropriate practices 3.1b – make informed choices in the use and conservation of natural resources by recycling or reusing materials such as paper, aluminum cans, and plastics</p> <p>CURRENT TEKS 3.1 Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices 3.1b make wise choices in the use and conservation of resources and the disposal or recycling of materials</p>	<p>Paper Sun models from Bridging II TAKS can be reused.</p> <p>Balloon models: (TAKScopes Engage activity)</p> <ul style="list-style-type: none"> • It is best to use a pump to inflate the balloons – protects against airborne blast of germs from a popped balloon. • Can be purchased at a discount store and used yearly. <p>Make note of and teach use of district-wide recycling resource.</p>	
<p>NEW TEKS: 3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations 3.2a – plan and implement descriptive investigations, including asking and answering questions, making inferences, and selecting and using equipment or technology needed, to solve a particular problem in the natural world</p> <p>CURRENT TEKS</p>	<p>These should be guided by / modeled by, and conducted as a group rather than independently.</p> <p>Teacher model the investigative / decision making process using the Think-Aloud technique</p> <p>The New TEKS do not hold students accountable for “experimental” investigations in 3rd grade, so they do not need to learn the specific terms of the Scientific Method, such as “hypothesis”, although the teacher can use them during investigations to introduce/model the vocabulary.</p> <p>Formal and informal terms in all areas of science should be used</p>	

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<p>3.2 Scientific processes. The student uses scientific methods during field and laboratory investigations</p> <p>3.2a 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>interchangeably for exposure.</p> <p>The emphasis in all types of investigations is the <u>systematic approach</u> used: students form questions or define a problem and develop a plan to answer their question or solve the problem using appropriate tools to implement the plan.</p> <p>Develop questions using resources such as Science Notebooks, KLEW charts and students sharing with one another</p> <p>EX: How does shade affect outdoor temperatures? OR Which planet would take the longest time to complete one revolution around the sun and why?</p> <p>Class discussion is a critical element to allow students to elaborate and build understanding</p> <p>Record their ideas, the process and discussion points in Science Notebooks</p>	
<p>NEW TEKS: 3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations</p> <p>3.2b – collect data by observing and measuring using the metric system and recognize differences between observed and measured data</p> <p>CURRENT TEKS 3.2 Scientific processes. The student uses scientific methods during field and laboratory investigations</p> <p>3.2b collect information by observing and measuring.</p>	<p>Connections: Math TEK 3.11a: linear measurement using standard units (Metric) Math TEK 3.12 measure temperature using a thermometer (Celsius)</p>	
<p>NEW TEKS: 3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations</p> <p>3.2d Analyze and interpret patterns in data to construct reasonable explanations based on evidence</p>	<ul style="list-style-type: none"> • Student generated explanations with justifications of reasoning. • This can be whole group, small group, partners or individuals • Both verbal and written in Science Notebook <p>The KLEW format is a graphic organizer that allows students to record learning pieces and show the connection to evidence</p>	

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<p>from investigations</p> <p>CURRENT TEKS 3.2 Scientific processes. The student uses scientific methods during field and laboratory investigations 3.2c analyze and interpret information to construct reasonable explanations from direct and indirect evidence.</p>		
<p>NEW TEKS: 3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations</p> <p>3.2f Communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion</p> <p>CURRENT TEKS 3.2 Scientific processes. The student uses scientific methods during field and laboratory investigations 3.2d communicate valid conclusions</p>	<p>Orally Written , and pictures in science notebook</p> <p>Discussion is important here as students compare results and make specific connections between the investigation – the concepts – and the supporting vocabulary Labeling of technical drawings, diagrams and pictures is a huge support for vocabulary development so that students will have a model to connect to the text</p>	
<p>NEW TEKS: 3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations</p> <p>3.2c Construct maps, graphic organizers, simple tables, charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data</p> <p>CURRENT TEKS 3.2 Scientific processes. The student uses scientific methods during field and laboratory investigations 3.2e construct simple graphs, tables, maps, and charts using tools including computers to organize, examine and evaluate information</p>	<p>Also connects to: Math TEKS 3.13a: Collect, organize, records, and display data in pictographs and bar graphs Math TEKS 3.15a: Explain and record observations using objects, words, pictures, numbers, and technology.</p> <p>Initial support for recording collected information should be more guided in the beginning of the year and move toward students making independent decisions on which type of graphic organizer to use as the year progresses.</p> <p>Use Science Notebook to build the skill of constructing ways to record data.</p>	
<p>NEW TEKS: 3.3 Scientific investigation and reasoning. The student knows that information, critical thinking,</p>	<p>Continue to support building understanding of using a <u>systematic approach</u> to solve a problem or answer a question</p>	

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<p>scientific problem solving, and the contributions of scientists are used in making decisions</p> <p>3.3a – in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations so as to encourage critical thinking by the student</p> <p>CURRENT TEKS 3.3 Scientific processes. The student knows that information, critical thinking, and scientific problem solving are used in making decisions. 3.3a analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.</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: EX of Critical Questioning:</p> <p>How does the evidence from our investigations show that the Sun provides heat energy to the Earth? OR Is it the Sun’s heat or light energy that causes the radiometer to move? Student should use and reference their Science Notebooks and one another</p>	
<p>NEW TEKS: 3.3 Scientific investigation and reasoning. The student knows that information, critical thinking, scientific problem solving, and the contributions of scientists are used in making decisions</p> <p>3.3c – represent the natural world using models such as volcanoes or Sun, Earth, and Moon system and identify their limitations, including size, properties, and materials</p> <p>CURRENT TEKS 3.3 Scientific processes. The student knows that information, critical thinking, and scientific problem solving are used in making decisions. 3.3c represent the natural world using models and identify their limitations.</p>	<p>For every model used during the year, ask the following questions:</p> <ul style="list-style-type: none"> • What is the model for? • What do the parts of the model represent? • How is the model the same as its target – the real thing? • How is the model different from its target – the real thing? • How well does the model represent its target? What can it not show? (limitations) <p>Use different models of each concept target where each different model is designed to highlight a different important part of the overall concept. The questions allow you to focus on each part of each model so that when all those parts combine, a better mental model is created for students.</p>	
<p>CURRENT TEKS 3.3 Scientific processes. The student knows that information, critical thinking, and scientific problem solving are used in making decisions. 3.3d evaluate the impact of research on scientific thought, society, and the environment.</p>	<p>Consider this through each unit of the year...it is an open discussion. There is an opportunity during Bundle 12 to focus more directly on this S.E.</p>	
<p>NEW TEKS: 3.4 Scientific investigation and reasoning. The</p>	<p>Metric units of measurement only Double pan balance with and without weights, platform scale, beakers,</p>	

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<p>student knows how to use a variety of tools and methods to conduct science inquiry</p> <p>3.4a – collect, record, and analyze information using tools including microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, wind vanes, rain gauges, pan balances, graduated cylinders, beakers, spring scales, hot plates, meter sticks, compasses, magnets, collecting nets, notebooks, sound recorders, and Sun, Earth, and Moon system models, timing devices including clocks and stopwatches and materials to support observation of habitats of organisms such as terrariums and aquariums</p> <p>3.4b – use safety equipment as appropriate, including safety goggles and gloves</p> <p>CURRENT TEKS 3.4 Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry 3.4a collect and analyze information using tools including calculators, microscopes, cameras, safety goggles, sound recorders, clocks, computers, thermometers, hand lenses, meter sticks, rulers, balances, magnets, and compasses.</p>	<p>graduated cylinders, hand lenses, magnets, notebooks</p> <p>Can include microscopes for further study.</p> <p>TEACHER NOTE: Teaching the proper use of tools should be scaffolded:</p> <ol style="list-style-type: none"> 1. Tools are modeled 2. Students are exposed through group interaction and then, 3. Individuals develop skills through multiple opportunities for practice during the year. <p>Tools and equipment, including senses, should be used in authentic learning settings including during an outside field investigation</p> <p>TEACHER NOTE: In linear measurement, one area of difficulty for students is the point of origin. As you measure distances in solar system models – emphasize that in that model – the point of origin (your zero) is the Sun</p>	
<p>NEW TEKS: 3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations</p> <p>3.2e – demonstrate the repeated investigations may increase the reliability of results</p> <p>CURRENT TEKS 3.4 Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry 3.4b demonstrate that repeated investigations may increase the reliability of results.</p>	<p>Repeated trials will not need to be done on every hands-on/ minds-on investigation during the year.</p> <p>There should be an opportunity to discuss or have a mini-lesson on the reason for repeating investigations during each bundle.</p> <p>It is good to remember that many demonstrations and investigations in science do not work in the classroom on a particular day – however, that is a great time to discuss repeating a test to get a more valid result – even if there is no time to actually try the demonstration or investigation again that day.</p>	