


4th Grade - Elementary Science Bundle # 3

Title	Suggested Dates
Weather & Representing Weather Patterns 	10/05/09 – 10/23/09 (13 days)

Big Idea/Enduring Understanding	Guiding Questions
<p>Water continuously moves through a cycle on the Earth that allows this life giving resource to be used and used again.</p> <p>The sun is the energy source for the water cycle, as well as for all life on Earth.</p> <p>Weather has recognizable patterns of change caused by the interaction of the Sun with the Earth.</p> <p>Weather data is measured and recorded to help define patterns and predict changes that inform personal decisions.</p>	<p>How does water move through the water cycle?</p> <p>What is the Sun’s role in weather?</p> <p>How does the water cycle relate to weather?</p> <p>How is wind created by the interaction of the Sun and Earth?</p> <p>What is important about weather forecasting?</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 4.8 Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system.</p> <p>4.8b describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process</p> <p>CURRENT TEKS 4.11 Science concepts. The student knows that the natural world includes earth materials and objects in the sky. 4.11c identify the Sun as the major source of energy for the Earth and understand its role in the growth of plants, in</p>	<p>2nd grade identifies the pieces of the water cycle 3rd grade identifies that the Sun provides the energy for the water cycle 4th grade concentrates on putting it altogether and in motion</p> <ul style="list-style-type: none"> • Effects of solar patterns: <ul style="list-style-type: none"> • Creation of winds • How air masses are characterized by the land/water over which they form (generally) • Air masses move in predictable patterns <p>Other connections:</p> <ul style="list-style-type: none"> ○ Uneven heating of the land and water by the Sun: <ul style="list-style-type: none"> ▪ Creates wind due to convection ▪ Creates another effect of the ocean on land – the cities that are located close to the ocean are cooler 	<p>Resources listed here apply to the entire bundle.</p> <p>Science Notebooks</p> <p>IF I TRY: intranet and Sci Curr Folder in campus share folders</p> <p>KLEW/ Claims & Evidence</p> <p>PISD Elem Science Homepage</p> <p>PISD K-5 Equipment Alignment – part of Vertical Alignment Document on curriculum page</p>

4th Grade - Elementary Science Bundle # 3

the creation of winds, and in the water cycle

than inland cities at similar latitudes.

[TAKScopes](#)

The Sun's Energy (4.11C)

Explore involves grouping terms on cards for the three parts of the TEK: plants – photosynthesis, formation of wind, water cycle

Water-FOSS KIT

Delta Education

[Fossweb](#)

properties of water
changes in water / water cycle
interactions between water and other earth materials
how humans use water

[United Streaming](#)

“Water Cycle, The”

Segments from:

“Weather Smart: Heat, Wind, and Pressure”:

- “How Temperature Affects Air”
- “Radiation from the Sun”
- “The Jet Stream”
- “Circulation”

For water cycle:

AIMS 4th Grade Texas Core Curriculum
Earth Book

- “Wondering About the Water Cycle” mini-book: p. 187 – 188
- “Checking on the Water Cycle” p. 189 – 193
- “The Solar Still” p. 206 – 211

For uneven heating of land and water:

AIMS 4th Grade Texas Core Curriculum
Earth Book

- “The Great Moderator” p 152 – 159 (includes ‘Shore Winds’ mini-book) – this gives data on shore and inland cities to use
- “Tub Temps” p. 135 – 142 – this experiment tests heating of soil and water over time

4th Grade - Elementary Science Bundle # 3

<p>NEW TEKS 4.8 Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system.</p> <p>4.8a measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key</p> <p>CURRENT TEKS 4.6 Science concepts. The student knows that change can create recognizable patterns. 4.6a identify patterns of change such as in weather, metamorphosis, and objects in the sky</p>	<p>Use weather tools to go outside and take local measurements:</p> <ul style="list-style-type: none"> • Temperature (Celsius and Fahrenheit) • Precipitation • Wind direction • Wind speed (within a range) • Air pressure <p>Use data to:</p> <ul style="list-style-type: none"> • Identify changes (daily, seasonally) • Compare to area weather map / weather forecast • Locate weather partners/pen pals (Globe network) etc. • Compare / use with Regions of Texas to understand weather patterns both locally and elsewhere 	<p>TAKScopes Patterns of Change: Weather (4.6A) Great Explore on weather front movement across a weather map</p> <p>United Streaming “Weather Smart – Heat , Wind, and Pressure”</p> <p>Atmosphere Flip Book (purpose is solely for students to have a better sense of where weather occurs – should not be a long or involved lesson) (template in Science Curriculum Folder on campus share drive)</p> <p>BrainPOP “Wind” “Water cycle” “Earth’s atmosphere” “Weather”</p>
<p>NEW TEKS 4.1 Scientific investigation and reasoning The student conducts classroom and outdoor investigations following home and school safety procedures and environmentally appropriate and ethical practices.</p> <p>4.1a demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigation</p> <p>4.1b make informed choices in the use and conservation of natural resources and reusing and recycling of materials such as paper, aluminum, glass, cans, and plastic</p> <p>CURRENT TEKS 4.1 Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices. 4.1a demonstrate safe practices during field and laboratory investigations 4.1b make wise choices in the use and conservation of resources and the disposal or recycling 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. Wash hands after science activities</p> <p>Review investigation safety procedures for both indoor and outdoor activities, as applicable:</p> <ul style="list-style-type: none"> • Directly point out possible safety risks • Discuss precautions • Share specific guidelines for the lesson <ul style="list-style-type: none"> ○ Use of equipment and materials ○ Respect for environment <p>Encourage students to identify these on their own throughout the year [document in science notebooks via words and/or pictures]</p> <p>Make note of and teach use of district-wide recycling resource.</p> <p>Health: -4.4f as it applies to indoor and outdoor science investigations; safety precautions</p>	

4th Grade - Elementary Science Bundle # 3

<p>Health 4.4 Health behaviors. The student understands and engages in behaviors that reduce health risks throughout the life span.</p> <p>Health4.4f identify strategies for avoiding deliberate and accidental injuries such as gang violence and accidents at school and home</p> <p>Health4.9 Personal/Intrapersonal Skills. The student uses social skills for building and maintaining healthy relationships throughout the life span.</p> <p>Health4.9h demonstrate refusal skills</p>	<p>-refusal skills: following peers misbehaving</p>	
<p>NEW TEKS</p> <p>4.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations.</p> <p>4.2a plan and implement descriptive investigations including asking well-defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions</p> <p>4.2b collect and record data by observing and measuring, using the metric system, and using descriptive words and numerals such as labeled drawings, writing, and concept maps</p> <p>4.2c construct simple tables, charts, bar graphs, and maps using tools and current technology to organize, examine, and evaluate data</p> <p>4.2d analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured</p> <p>4.2e perform repeated investigations to increase the reliability of results</p> <p>4.2f communicate valid, oral, and written results supported by data</p>	<p>New 4.2a: 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>Question Example: What causes water to move from one part of the water cycle to another? OR How does the Sun affect the weather and the water cycle?</p> <p>Class discussion is a critical element to allow students to elaborate and build understanding</p> <p>New 4.2b: Use Science Notebook to build the skill of constructing ways to record data. Record their ideas, the process and discussion points</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>	

4th Grade - Elementary Science Bundle # 3

CURRENT TEKS

4.2 Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations.

4.2a plan and implement descriptive investigations including asking well defined

4.2b collect information by observing and measuring

4.2e construct simple graphs, tables, maps, and charts to organize, examine, and evaluate information.

4.2c analyze and interpret information to construct reasonable explanations from direct and indirect evidence

4.4 Scientific Processes. The student knows how to use a variety of tools and methods to conduct science inquiry

4.4b demonstrate that repeated investigations may increase the reliability of results

4.2d communicate valid conclusions

New 4.2c: Math connections:

Math TEK 4.11a: Estimate and use measurement tools to determine length (including perimeter), area, capacity and weight/mass using standard units, SI (metric) and customary
.Math TEK 4.12a Use a thermometer to measure temperature and changes in temperature (Celsius)

New 4.2d and e: Claims and Evidence:

- Student generated explanations: always justify reasoning with evidence
 - The KLEW format is a graphic organizer: students record learning and show the connection to evidence (the L and E section)
- This can be whole group, small group, partners or individuals
 - Discussion is important – students compare results and make specific connections between the investigation – the concepts – and the supporting vocabulary
- Construct explanations verbally and in Science Notebook (write and draw)
 - Labeling technical drawings, diagrams and pictures is a huge support for vocabulary development – creates a model to connect to the text

Related Math TEKS:

TEKS 4.15a: Explain and record observations using objects, words, pictures, numbers, and technology.

New 4.2e:

Repeated trials will not need to be done on every hands-on/ minds-on investigation during the year.

There should be an opportunity to discuss or have a mini-lesson on the reason for repeating investigations during each bundle.

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.

4th Grade - Elementary Science Bundle # 3

<p>NEW TEKS 4.3 Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions.</p> <p>4.3a 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>4.3b draw inferences and evaluate accuracy of services and product claims found in advertisements and labels such as toys, food, and sunscreen</p> <p>4.3c represent the natural world using models such as rivers, stream tables, or fossils, and identify their limitations, including accuracy and size</p> <p>4.3d connected grade level appropriate concepts with the history of science, science careers, and contributions of science</p> <p>CURRENT TEKS 4.3 Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions.</p> <p>4.3a analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information</p> <p>4.3b draw inferences based on information related to promotional materials for products and services</p> <p>4.3c represent the natural world using models and identify their limitations</p> <p>4.3e connect Grade 4 science concepts with the history of science and contributions of scientists</p>	<p>Continue to support building understanding of using a <u>systematic approach</u> to solve a problem or answer a question</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. Use reflective discussions to review learning and the evidence for it. Look for connections in results to develop and answer questions about the scientific concepts studied.</p> <p>Example of Critical Questioning:</p> <p>How is mankind interfering with the water cycle? OR How does knowing past weather information help with forecasting future weather?</p> <p>Student should use and reference their Science Notebooks and one another</p> <p>New 4.3c: 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 4.3 Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions.</p> <p>4.3d evaluate the impact of research on scientific thought,</p>		

4th Grade - Elementary Science Bundle # 3

<p>society, and the environment</p>		
<p>NEW TEKS 4.4 Scientific investigation and reasoning. The student knows how to use a variety of tools, materials, equipment, and models to conduct science inquiry.</p> <p>4.4a collect, record, and analyze information using tools including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, mirrors, spring scales, pan balances, triple beam balances, graduated cylinders, beakers, hot plates, meter sticks, compasses, magnets, collecting nets, and notebooks; timing devices including clocks and stopwatches and materials to support the observation of habitats such as terrariums and aquariums</p> <p>4.4b use safety equipment as appropriate, including goggles and gloves</p> <p>CURRENT TEKS 4.4 Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. 4.4a collect and analyze information using tools including calculators, safety goggles, microscopes, cameras, sound recorders, computers, hand lenses, rulers, thermometers, meter sticks, timing devices, balances, and compasses 4.4(B) is with New 4.2(E)</p> <p>Health4.9 Personal/Intrapersonal Skills. The student uses social skills for building and maintaining healthy relationships throughout the life span.</p> <p>Health4.9f analyze strengths and weaknesses in personal communication skills</p>	<p>Metric units of measurement only</p> <p>Can include microscopes for further study.</p> <p>TEACHER NOTE: Teaching the proper use of tools should be scaffolded:</p> <ul style="list-style-type: none"> • Tools are modeled • Students are exposed through group interaction and then, • 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.</p> <p>Health: -personal communication via science notebooks</p>	