5th Grade - Elementary Science Bundle # 2

Title	Suggested Dates
Natural Patterns and Cycles	9/14/09 – 10/02/09 (14 days)

Big Idea/Enduring Understanding	Guiding Questions
Natural processes interact and influence complex systems.	How does the Sun affect the salinity of water on Earth? Why could you say that the water cycle is a type of filtration system for our Earth? What are the similarities and differences between climate and weather? Why is it important to recognize the patterns in weather to understand the climate of an area?

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)
	Resources listed here apply to the entire bundle. Science Notebooks — IF I TRY (Intranet) — KLEW/ Claims & Evidence PISD Elem Science Homepage — PISD K-5 Equipment Alignment	
NEW TEKS **5.8 Earth and Space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system** 5.8a differentiate between weather and climate	These are not lessons on **weather** processes. Weather and climate : study of change over time Weather: occurring daily Climate: "Weather over time": the pattern of weather; generally prevailing weather conditions of a region, as temperature, air pressure, humidity, precipitation, sunshine, cloudiness, and winds, throughout the year, averaged over a series of years	BrainPop "Climate Types" United Streaming "Water Smart: The Sun, Water Cycle and Climate" (15:01) "Earth Science: Weather and Climate" (20:00)
NEW TEKS **5.8 Earth and Space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system** 5.8b explain how the Sun and the ocean	This is the relationship between the two with a deeper understanding than simply "ocean water evaporates". 2nd Grade identifies the "pieces" to the water cycle; 3rd and 4th grade look at the energy source (Sun) and view the processes as a system. Build review of the water cycle and changes that occur as you focus on this new TEKS. Looking at: surface area of the ocean in terms of overall amount of	"The Ocean Affect" Science Curriculum Folder in the campus share folder. NASA Science: Earth http://nasascience.nasa.gov/earth-science/oceanography/ocean-earth-system/ocean-

interact in the water cycle	evaporation; Sun's heating of the ocean and variances there (depth, connections to relationship between Sun and Earth, salinity, etc). Oceans serve as "filtration" systems (salt to fresh) – discuss why this is important. What is meant by "water shortage" if most of the Earth is covered by water?	water-cycle National Center for Atmospheric Research (mostly a site for teachers) http://www.ncar.ucar.edu/research/earth_system/watercycle.php National Oceanic and Atmospheric Administration http://oceanservice.noaa.gov/education/pd/oceans_weather_climate/welcome.html Earth: A Dynamic Structure http://www.ucmp.berkeley.edu/education/dynamic/session4/sess4_hydroatmo1.htm Teacher's Domain: http://www.teachersdomain.org/resource/ess05.sci.ess.watcyc.oceancur/
CURRENT TEKS **5.11 Science concepts. The student knows that certain past events affect present and future events.** 5.11a identify and observe actions that require time for changes to be measurable, including growth, erosion, dissolving, weathering, and flow	This is a connecting TEKS used to remember to identify the fact that this process is completed over time and, as a weather process, interacts with effects on land, such as weathering, erosion, and deposition (ex: oceans' effect on coast, etc.	
CURRENT TEKS **5.1 Scientific Processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices.** 5.1a demonstrate safe practices during field and laboratory investigations 5.1b make wise choices in the use and conservation of resources and the disposal or recycling of materials NEW TEKS	No tasting or touching unless instructed Safe smelling – wafting Goggles Wait for teacher directions Wash hands after science activities Review investigation safety procedures for both indoor and outdoor activities, as applicable: • Directly point out possible safety risks • Discuss precautions • Share specific guidelines for the lesson o Use of equipment and materials o Respect for environment Encourage students to identify these on their own throughout the year	

5.1 Scientific investigations and reasoning. The student conducts classroom and outdoor investigations following home and school safety procedures and environmentally appropriate and ethical practices. 5.1a demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations 5.1b make informed choices in the conservation, disposal, and recycling of materials	[document in science notebooks via words and/or pictures] Make note of and teach use of district-wide recycling resource.	
CURRENT TEKS **5.2 Scientific processes. The student uses scientific methods during field and laboratory investigations** 5.2a plan and implement descriptive and simple experimental investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology 5.2b collect information by observing and measuring 5.2c analyze and interpret information to construct reasonable explanations from direct and indirect evidence 5.2d communicate valid conclusions 5.2e construct simple graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate information NEW TEKS **5.2 Scientific investigations and reasoning. The student uses scientific methods during**	The emphasis in all types of investigations is the systematic approach 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. Develop questions using resources such as Science Notebooks, KLEW charts and students sharing with one another Class discussion is a critical element to allow students to elaborate and build understanding Use Science Notebook to build the skill of constructing ways to record data. Record their ideas, the process and discussion points. 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. Claims and Evidence: • Student generated explanations: always justify reasoning with evidence o 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 o Discussion is important – students compare results and make specific connections between the investigation – the concepts –	

laboratory and outdoor investigations 5.2a describe, plan, and implement simple experimental investigations testing one variable 5.2b ask well-defined questions, formulate testable hypothesis, and select and use appropriate equipment and technology 5.2c collect information by detailed observation and accurate measuring 5.2d analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence 5.2e demonstrate that repeated investigations may increase the reliability of results 5.2f communicate valid conclusions in both written and verbal forms 5.2g construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information	and the supporting vocabulary • Construct explanations verbally and in Science Notebook (write and draw) o Labeling technical drawings, diagrams and pictures is a huge support for vocabulary development – creates a model to connect to the text 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.	
CURRENT TEKS **5.3 Scientific Processes. The student uses critical thinking and scientific problem solving to make informed decisions.** 5.3a analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information 5.3b draw inferences based on information related to promotional materials for products and services 5.3c represent the natural world using	Continue to support building understanding of using a systematic approach to solve a problem or answer a question 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. 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. Example of Critical Questioning: What would have to change to make significant differences in an areas climate with regard to the oceans? Why?	

models and identify their limitations 5.3d evaluate the impact of research on scientific thought, society, and the environment 5.3e connect Grade 5 science concepts with the history of science and contributions of scientists NEW TEKS **5.3 Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions** 5.3a 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 5.3b evaluate the accuracy of the information related to promotional materials for products and services such as nutritional labels 5.3c draw or develop a model that represents how something works or looks that cannot be seen such as how a soda dispensing machine works 5.3d connect grade level appropriate science concepts with the history of science, science careers, and contributions of scientists	OR Does ocean temperature affect rate of evaporation? Student should use and reference their Science Notebooks and one another For every model used during the year, ask the following questions: • 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) 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.	
CURRENT TEKS **5.4 Scientific Processes. The student knows how to use a variety of tools and methods to conduct science inquiry**	Metric units of measurement only **TEACHER NOTE:** Teaching the proper use of tools should be scaffolded: 1. Tools are modeled 2. Students are exposed through group interaction and then, 3. Individuals develop skills through multiple opportunities for practice	

5.4a collect and analyze information using tools including calculators, microscopes, cameras, sound recorders, computers, hand lenses, rulers, thermometers, compasses, balances, hot plates, meter sticks, timing devices, magnets, collecting nets, and safety goggles 5.4b demonstrate that repeated investigations may increase the reliability of results NEW TEKS **5.4 Scientific investigation and reasoning. The student knows how to use a variety of tools and methods to conduct science inquiry.** 5.4a collect, record, and analyze information using tools including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, prisms, mirrors, pan balances, triple beam balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices including clocks and stopwatches, and materials to support the observation of habitats of organisms such as terrariums and aquariums 5.4b use safety equipment including safety goggles and gloves	during the year. Tools and equipment, including senses, should be used in authentic learning settings including during an outside field investigation	