3rd Grade - Elementary Science Bundle #6

Title	Suggested Dates
Scientific Investigation and Reasoning	12/7/09 – 12/18/09 (10 days)

Big Idea/Enduring Understanding	Guiding Questions
Science is an ongoing cycle of questioning and problem solving. We ask certain questions to find out certain information.	How can I learn new things on my own? How can I use my senses and other tools to help me learn things? How can I gather information and organize it? How can asking questions and finding the answers look differently depending on what I want to know?

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)
Bundle 6 is only 10 days long and falls directly before the holidays with many conflicting events. Feedback from last year indicated a desire to have a point near the middle to touch base and more directly revisit process skills as well. The process skills should be and are built into every bundle, but Bundle 6 does allow time for additional focus,. In terms of formal science projects, 3rd grade completes class projects as one means of directly teaching these skills. These are completed according to the campus science project / science fair plan. Projects can be completed, begun, or continued during this bundle if this correlates to your campus plan. Bundle 6 does provide an excellent opportunity to focus on questioning and critical thinking skills as a means of finding information and developing literacy and communication skills. Questioning skills are not limited to "testable questions" used in full investigations and science fair projects. It is a time to purposely connect thinking and learning.		
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.** 3.1a demonstrate safe practices as described in the Texas Safety Standards during classroom and outdoor investigations, including observing a schoolyard habitat 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	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 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] **TEACHER NOTE**: When possible, return natural items to their environment (i.e. rocks back to garden)	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 PISD Safety Website -Safety Contracts, games, etc -Science Safety is Elementary (for teachers)

Health3.2 Health behaviors. The student recognizes and performs behaviors that reduce health risks throughout the life span. Health3.2a explain the need for obeying safety rules at home, school, work, and play such as bike safety and avoidance of weapons Health3.2e describe the importance of taking personal responsibility for reducing hazards, avoiding accidents, and preventing accidental injuries **Health3.9 Personal/interpersonal skills. The student uses social skills in building and maintaining healthy relationships.** Health3.9f demonstrate refusal skills	Make note of and teach use of district-wide recycling resource.	-Safety in the Elementary Classroom (for teachers) DuPont Science Safety Zone website Texas Science Safety Standards PISD Science Project / Science Fair Guide: 2009-2010 (Science Curriculum Information folder inside of the campus share folder or see your Campus Science Fair Contact) Investigations / concepts previously conducted can be expanded here; students can design a new investigation by altering the question to a previous investigation.
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 CURRENT TEKS **3.2 Scientific processes. The student uses scientific methods during field and laboratory investigations.** 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	These should be guided by / modeled by, and conducted as a group rather than independently. 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 model the vocabulary. Formal and informal terms in all areas of science should be used interchangeably for exposure. 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. Teacher model the investigative / decision making process using the Think-Aloud technique 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 Record their ideas, the process and discussion points in Science Notebooks	Investigations setting the stage for upcoming expansion and ideas can be conducted here. **AIMS** – Texas Core Curriculum Nature of Science (3rd) or other related AIMS resources including AIMS E-Activities such as: "Can Counts" pp. 25-33 (conservation of natural resources), and "Thumb Fun" pp. 48-54 (structures and functions, Bundle #7) **Vernier Probeware** / Logger Lite for data collection. Probeware can be found on each laptop cart (Go Temp!). Logger Lite software allows real time data collection. Elementary computer images already have this software loaded. Lessons are in the campus library as well as in the Sci Curriculum Info folder in each campus share folder.

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NEW TEKS: **3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations.** 3.2b collect data by observing and measuring using the metric system and recognize differences between observed and measured data CURRENT TEKS **3.2 Scientific processes. The student uses scientific methods during field and laboratory investigations.** 3.2b collect information by observing and measuring	Connections: Math TEK 3.11a: linear measurement using standard units (Metric) Math TEK 3.12 measure temperature using a thermometer (Celsius) Measure the following to the nearest whole number: Mass (g.) using double pan balance with gram masses Volume (ml.) using beakers and/or graduated cylinders	
NEW TEKS: **3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations.** 3.2d Analyze and interpret patterns in data to construct reasonable explanations based on evidence from investigations 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	• Student generated explanations with justifications of reasoning. • This can be whole group, small group, partners or individuals • Both verbal and written in Science Notebook The KLEW format is a graphic organizer that allows students to record learning pieces and show the connection to evidence	
NEW TEKS: **3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations.** 3.2f Communicate valid conclusions supported by data in writing, by drawing pictures, and through verbal discussion CURRENT TEKS **3.2 Scientific processes. The student uses scientific methods during field and laboratory investigations.** 3.2d communicate valid conclusions	Orally Written , and pictures in science notebook 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	
NEW TEKS: **3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations.** 3.2c construct maps, graphic organizers, simple tables,	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.	

charts, and bar graphs using tools and current technology to organize, examine, and evaluate measured data 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	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. Use Science Notebook to build the skill of constructing ways to record data.	
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.** 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 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	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 develop and answer questions about the scientific concepts studied. Student should use their Science Notebooks and one another as references/ resources	Using Science Notebooks in Elementary Classrooms by Michael Klentschy (Chapter: Questioning). This book can be found in your campus professional development collection (library). Using Science Notebooks in Elementary Classrooms by Michael Klentschy (Chapter: Conclusions). This book can be found in your campus professional development collection (library).
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.** 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 CURRENT TEKS **3.3 Scientific processes. The student knows that information, critical thinking, and scientific problem solving are used in making decisions.**	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	

3.3c represent the natural world using models and identify their limitations		
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	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.	
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.** 3.3d connect grade level appropriate science concepts with the history of science, science careers, and contributions of scientists CURRENT TEKS **3.3 Scientific processes. The student knows that information, critical thinking, and scientific problem solving are used in making decisions.** 3.3e connect Grade 3 science concepts with the history of science and contributions of scientists **Health3.9 Personal/Intrapersonal skills. The student uses social skills in building and maintaining healthy relationships.** Health3.9a demonstrate effective verbal and nonverbal communication Health3.9d demonstrate effective listening skills		
NEW TEKS: **3.4 Scientific investigation and reasoning. The student knows how to use a variety of tools and methods to conduct science inquiry.** 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	Metric units of measurement only Double pan balance with and without weights, platform scale, beakers, graduated cylinders, hand lenses, magnets, notebooks Can include microscopes for further study. **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 during the year.	

system models, timing devices including clocks and stopwatches and materials to support observation of habitats of organisms such as terrariums and aquariums 3.4b use safety equipment as appropriate, including safety goggles and gloves 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	Tools and equipment, including senses, should be used in authentic learning settings including during an outside field investigation	
NEW TEKS: **3.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations.** 3.2e demonstrate the repeated investigations may increase the reliability of results 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	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.	
NEW TEKS: ***3.8 Earth and Space. The student knows there are recognizable patterns in the natural world and among objects in the sky.*** *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* ***(On-going)***	• *Keep weather log of local weather data – develop skills using weather tools introduced in 2nd grade.* • *Gather temperature and rainfall data from selected environments in multiple areas that differ from the local environment.* *This also models and provides experience gathering and recording data over time.* *The data will be used during Bundles **7 and 8** to make seasonal comparisons and environmental climate comparisons.*	*Weatherbug* *www.TAKScopes.com* *Topic: Earth Science* *4th – Patterns of Change: Weather* *Student Journal pp. 2-3 – Weather Data Chart (eliminate Cloud Type)*