



4th Grade - Elementary Science Bundle 1

Title			Suggested Dates
Safety, Processes, and Notebooks			Aug 24 – Sept 10 (13 days)
Link to Assessment Link to Related Assurance Words Link to Related Literature Link to Universal Design			

Big Idea/Enduring Understanding	Guiding Questions
Safety should always be considered when exploring, learning, and using various tools and equipment both inside and outside of the classroom. Notebooks help us organize our thoughts, data, and learning. Science is an ongoing cycle of questioning and problem solving.	Why do we need to be careful when we are doing classroom or outdoor investigations? How do we organize our thoughts, information, connections, and other data? What skills and tools do we use as scientist?

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)
Science Notebooks: As part of Bundle 1, students set up their science notebook. This includes adding all of the components and making an initial entry. Initial entries should be made outside of a regular investigation and should be a lesson itself. Throughout the year, notebooks should be used as a teaching tool for various ELA skills and should be done through teacher modeling and group entries as well as individual entries. PISD Science Notebook Page		
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. The student is expected to: 4.1a demonstrate safe practices and the use of safety equipment as described in the Texas Safety Standards during classroom and outdoor investigations	<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 the environment • Safety Rules, including but not limited to: <ul style="list-style-type: none"> ○ Goggles and gloves, as needed ○ No tasting or touching unless instructed ○ Safe smelling – wafting ○ Wait for teacher direction ○ No glassware ○ Student do not handle hot water; hot plates, or burners ○ Wash hands after science activities 	PISD Science Safety Page Texas Science Safety Standards DuPont Science Safety Zone AIMS 4th Grade Texas Core Curriculum Nature of Science Field Safety, page 15 Science Safety Sets, page 27 Gateways 4th Grade 0.1 Safety, page TE3 (GT Extension) Science Safety Game Quirkles “Inquistive Inman”

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<p>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. The student is expected to:</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>Discuss campus recycling program</p>	<p><u>AIMS 4th Grade Texas Core Curriculum Nature of Science Tree Keepers</u>, page 32</p> <p><u>Brainpop Jr “Reduce, Reuse, Recycle” video and activity</u></p> <p>ELPS (1A, 1C, 1E, 2C, 2E, 2G, 4C, 4D)</p>
<p>4.2 Scientific investigation and reasoning. The student uses scientific inquiry methods during laboratory and outdoor investigations. The student is expected to:</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>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>Including:</p> <ul style="list-style-type: none"> • Asking questions • Making observations and collecting data • Analyzing data • Forming conclusions based on the data 	<p><u>What are descriptive, comparative, and experimental investigations?</u> 5th graders experience all three types.</p> <p><u>AIMS 4th Grade Texas Core Curriculum Nature of Science Learning More</u>, page 48</p> <p><u>Nature of Science</u>, page 50</p> <p><u>Gateways 4th Grade 0.2 Making Observations</u>, page TE 7</p>
<p>4.3 Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:</p> <p>4.3a in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical</p>	<p>Including:</p> <p>Discussing, analyzing, considering evidence and multiple points of view</p>	<p><u>Using Socratic Seminars for higher-order thinking and discussion</u></p> <p><u>Multisensory Strategies for Science Vocabulary by Sandra Husty and Julie Jackson</u> includes Bag & Tag</p> <p><u>Science Vocabulary Hang-man</u></p>

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<p>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>4.3 Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:</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>Including:</p> <ul style="list-style-type: none"> • Student generated models • Minimum three models / representations per concept • Asking / considering the following questions: <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 the real thing? ○ How is the model different from the real thing? ○ How well does the model represent the real thing; what can't it show? 	
<p>4.3 Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:</p> <p>4.3d connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists</p>	<p>Including:</p> <ul style="list-style-type: none"> • Science refers to a system of acquiring knowledge using observation and experimentation to describe and explain natural phenomena. • Science is a systematic field of study or the knowledge gained from it • The purpose of science is to produce useful models of reality • Natural Sciences: the study of the natural world • Social Sciences: the systematic study of human behavior and society • Scientist - broad definition: any person who engages in a systematic activity to acquire knowledge 	<p>What is a Scientist?</p>
<p>4.4 Scientific investigation and reasoning. The student knows how to use a variety of tools, materials, equipment, and models to conduct science inquiry. The student is expected to:</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 observation of habitats of organisms such as terrariums and aquariums</p>	<p>Metric only</p> <p>NOTE:</p> <p>Scaffolding for introducing new tools:</p> <ol style="list-style-type: none"> 1. Tools are modeled 2. Students are exposed and gain experience through group interaction 3. Individuals develop skills through multiple opportunities for practice throughout year 	<p>Tools of the Science Classroom animation</p> <p>How to Use a Metric Ruler animation</p>

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4.4b use safety equipment as appropriate, including safety goggles and gloves		
Related Assurance Words Back to Top		
conservation, design, examine, source, system		
Related Literature Back to Top		
<p>Science Safety: Being Careful by Lionel Bender</p> <p>Lessons in Science Safety with Max Axiom, Super Scientist by Donald Lemke</p> <p>Don't Be Hasty with Science Safety! By Bridget Pedersen</p> <p>What is a Scientist? By Barbarah Lehn</p> <p>How to Think Like a Scientist: Answering Questions by the Scientific Method by Stephen Kramer</p> <p>Investigating the Scientific Method with Max Axiom, Super Scientist by Donald Lemke</p> <p>Recycle! A Handbook for Kids by Gail Gibbons</p> <p>Recycling by Rhonda Lucas Donald</p> <p>Here Comes the Recycling Truck! By Meyer Seltzer</p>		
Assessment Support	Region XIII Science TAKS Resources	www.tmsds.org Back to Top
Assessment Probes		Performance Assessment
<p>Uncovering Students' Ideas in Science, Vol. 4 (Page Keeley)</p> <p>"Is it a Model?", page 73</p> <p>"Is it a System?", page 81</p>		
Scenario / Open Ended		Multiple Choice
<p>Gateway – 4th Grade, Safety Assessment, page TE6</p> <p>Gateway – 4th Grade, Making Observations Assessment, page TE11</p>		<p>Gateway – 4th Grade, Safety Assessment, page TE6</p> <p>Gateway – 4th Grade, Making Observations Assessment, page TE11</p>

PISD Universal Design Consideration Points	Universal Design: Link to Barriers and Solutions Tool	What is This?	Back to Top
Current Methods and Materials	Possible Challenges	Possible Solutions	
Lab Safety / Lab equipment	Vocabulary	<p>Found in the Sci Curr Information Folder (4th Grade Bundle 1) on your campus share drive:</p> <p>Lab_Safety.flipchart (Must have Promethean Board to use)</p> <p>safety_quiz.flp</p> <p>safety_quiz.ppt (Same as above for non-Promethean users)</p> <p>Boardmaker Activities – Scientific Method Boardmaker Share</p>	
Using Science Notebooks	<ul style="list-style-type: none"> • Handwriting [illegible, size) • Drawing • Transferring of information • Reading text back 	<p>Offer a variety of writing instruments (such as mechanical pencil, pencil grip, word processing), paper (such as color paper, shaded-lined, raised-lined, paper size, surfaces (such as larger surface, slant board),</p>	

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	<ul style="list-style-type: none"> • Organization • Physical manipulation of materials (notebook, pages, etc) • Language acquisition and expression • Engagement • Vision 	<p>Writing / Drawing on a variety of surfaces, such as on a white board (taking picture of work), digital medium, scanning documents, document camera screen capture, screen shots, different thicknesses of paper, page flippers</p> <p>Audacity, iPods and other digital recorders, Voice-comment on PowerPoint, WORD, voiceovers</p> <p>Graphic organizers (template provided), pre-printed notes / labels / word banks, clip-art or pics-for-learning banks WORD forms, sentence stems, visual word wall (such as bag-n-tag), graph club (charts and tables)</p> <p>Reading in native language prior to instruction, Quad Cards, Frayer, 4 Square vocabulary, Kinesthetic Vocabulary, Solo Word Dictionary</p> <p>Text to Speech, word prediction, composition and processing through partner work, scribing, icon / visual representation of written work (electronic, magazine sources, etc), Inspiration</p> <p>Science Supplemental Aids integrated Science / TAKS related resource links!</p> <p>Promethean Board (interactive manipulation with larger items)</p> <p>Page markers such as: sticky notes, string attached to back of book as an attached bookmark, tabs, marker coloring on edge of papers, cut corners off, pre-numbered / label numbered, prompt / sentence stem options color coded and/or printed on labels, magnetic bookmark</p> <p>Table Leaders / team captains indicate group readiness</p> <p>Consistent format for title entries, usage procedure; consistent reminders of these procedures, visual and accessible reminders of these procedures</p> <p>Notebook options: binder with page protectors, binder with adapted paper, digital notebooks</p>
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