


3rd Grade - Elementary Science Bundle # 3

Title		Suggested Dates
Formation of Soil		10/05/09 – 10/23/09 (13 days)

Big Idea/Enduring Understanding	Guiding Questions
The Earth’s surface and its natural resources are constantly changing. Matter has physical properties (in relation to soil’s properties)	What are some ways of classifying soil? How does soil change over time? How is soil formed? Why should we reuse soil?

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: 3.5 Matter and energy. The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used.</p> <p>3.5a measure, test, and record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float</p> <p>CURRENT TEKS 3.7 Science concepts. The student knows that matter has physical properties. 3.7a gather information including temperature, magnetism, hardness, and mass using appropriate tools to identify physical properties of matter</p> <p>3.11 Science concepts. The student knows that the natural world includes earth materials and objects in the sky. 3.11b Identify and record properties of soils such as color and texture, capacity to retain water, and ability to support the growth of plants</p>	<p>Students should be involved in active observation of a variety of soil samples from a variety of sources.</p> <p>Soils should be authentically obtained by the student as well as being provided by the teacher.</p> <p>EX: Student brings in soil from baseball field, trip to Missouri, home or school playground</p> <p>Students need to observe and compare physical properties of soils and build their own “classification” systems based on those properties.</p> <p>Students need to test properties through manipulating the materials with various tools. EX: of testing for properties</p> <ul style="list-style-type: none"> • Measure and compare the mass of different soil samples <ul style="list-style-type: none"> ○ Use the same volume of each sample ○ Use identical containers for each sample • Magnetism • Color • Texture – both wet and dry <p>This is another opportunity to look at what is “alike” and “different” about these Earth materials</p>	<p>Resources listed here apply to the entire bundle.</p> <p>Science Notebooks</p> <p>IF I TRY – intranet and in Sci Curr Info in each Campus Share Folder</p> <p>KLEW/ Claims & Evidence</p> <p>PISD Elem Science Homepage</p> <p>PISD K-5 Equipment Alignment (part of Vertical Alignment Document found on curriculum site)</p> <p>Elementary Globe: Soil “Getting to Know Soil” “Soil Treasure Hunt” “We All Need Soil”</p> <p>AIMS 1st Grade Texas Core Curriculum Earth Science Book “Soil Study” pp. 160-169</p>

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	<p>The observation of properties should be used to support the focus of the new TEKS – which is the process of soil formation – and comparing different soils in relation to amounts of plant/animal remains in them, looking at details that can help students think about the connection between the soil parts and the different sources that created each soil.</p>	<p>Wildlife Gardener, A Junior Master Gardener Golden Ray Series Activity 2 – Touchy feely, Mud Pies, Shake, Rattle & Roll</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>Model the topsoil/subsoil/bedrock layers to show how plants interact in the process of soil formation</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>BrainPOP Jr.: Soil</p> <p>BrainPOP: Soil</p> <p>United Streaming: Getting to Know Soil (23 min)</p> <p>SOIL BOOK Template: (Science Curr Folder in campus Share folder- using soil and seeds. This reinforces topsoil, subsoil, and bedrock layers that they need for understanding other concepts in later years.)</p>
<p>NEW TEKS: 3.7 Earth and Space. The student knows that Earth consists of natural resources and its surface is constantly changing.</p> <p>3.7a explore and record how soils are formed by weathering of rock and the decomposition of plant and animal remains</p>	<p>Focus is on the process of creating soil through the weathering of rock. Study is not on rocks or the rock cycle...rocks are the source or resource material that is weathered to form soil</p>	<p>AIMS 3rd Grade Texas Core Curriculum Earth Book “What Makes Soil” pp. 170-178</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>CURRENT TEKS 3.1 Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate</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 identify these on their own throughout the year [document in science notebooks via words and/or pictures]</p>	<p>PISD Safety Website</p> <p>DuPont Science Safety Zone website</p> <p>Texas Science Safety Standards</p>

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<p>and ethical practices. 3.1a demonstrate safe practices during field and laboratory investigations</p> <p>Health3.2 Health behaviors. The student recognizes and performs behaviors that reduce health risks throughout the life span.</p> <p>Health3.2a explain the need for obeying safety rules at home, school, work, and play such as bike safety and avoidance of weapons</p> <p>Health3.2e describe the importance of taking personal responsibility for reducing hazards, avoiding accidents, and preventing accidental injuries</p> <p>Health3.9 Personal/interpersonal skills. The student uses social skills in building and maintaining healthy relationships.</p> <p>Health3.9f demonstrate refusal skills</p>	<p>Health: -safety in indoor and outdoor investigations -behavior and choices made during investigations, precautions taken, identifying possible safety hazards -refusal skills: to peers regarding behavior and/or unsafe choices during science investigations</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>3.1b 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>Proper handling of soils: During the school year:</p> <ul style="list-style-type: none"> • How can we reuse the soil? Dry the samples and have another class use them? <p>End of year</p> <ul style="list-style-type: none"> • Dispose of soil– recycle soils into proper area of environment – do not need to throw soils away <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.</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>AIMS Texas, <u>Earth Science</u>: “Soil Shakes” pp. 179-186 “Soil Shakers” pp. 187-193 “Which Soil Works Best” pp. 194-199</p>

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<p>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 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</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 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 EX: Which soil dries out more quickly?</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>“Don’t Mix Me Up” pp. 200-209</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. 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>Also include the following measurements to the nearest whole number: Mass (g.) using double pan balance with gram masses Volume (ml.) using beakers and/or graduated cylinders</p> <p>Predict mass based on characteristics they see – which soil sample “looks” heavier. Put soil samples in order from predicted lightest to heaviest – then test the prediction by finding the mass of each sample. This can be comparative mass – comparing samples on the double pan balance.</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 from</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>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</p> <p>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</p> <p>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, 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</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.</p>	

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<p>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>Use reflective discussions to develop and answer questions about the scientific concepts studied: EX of Critical Questioning:</p> <p>Based on the evidence from our investigations, which type of soil is best to use for a baseball field? OR Can you tell by looking at soil what rocks the soils are made from?</p> <p>Student should use their Science Notebooks and one another as a reference, a resource and a place to record ideas, learning, questions, etc.</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 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, Celsius thermometers, hand</p>	<p>Metric units of measurement only Double pan balance with and without weights, platform scale, beakers, 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>Health: -science notebooks -peer and class interaction</p>	

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<p>lenses, meter sticks, rulers, balances, magnets, measuring cups, beakers, graduated cylinder, and compasses</p> <p>Health3.9 Personal/Intrapersonal skills. The student uses social skills in building and maintaining healthy relationships.</p> <p>Health3.9a demonstrate effective verbal and nonverbal communication</p> <p>Health3.9d demonstrate effective listening skills</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>	
<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>	<ul style="list-style-type: none"> • <i>Keep weather log of local weather data – develop skills using weather tools introduced in 2nd grade.</i> • <i>Gather temperature and rainfall data from selected environments in multiple areas that differ from the local environment.</i> <p><i>This also models and provides experience gathering and recording data over time.</i></p> <p><i>The data will be used during Bundles 7 and 8 to make seasonal comparisons and environmental climate comparisons.</i></p>	<p><u>Weatherbug</u></p> <p><u>www.TAKScopes.com</u> Topic: Earth Science <u>4th – Patterns of Change: Weather Student Journal pp. 2-3 – Weather Data Chart (eliminate Cloud Type)</u></p>