3rd Grade - Elementary Science Bundle # 11

Title	Suggested Dates
Energy and Motion	4/19/10 – 5/7/10 (15 days)

Big Idea/Enduring Understanding	Guiding Questions
Forces cause change and energy exists in many forms.	What is energy? How is energy classified? How does a force cause change? How is gravity different from magnetism?

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)
NEW TEKS: **3.6 Force, motion, and energy. The student knows that forces cause change and that energy exists in many forms.** 3.6a explore different forms of energy, including mechanical, light, sound, and heat / thermal in everyday life	Everyday examples (models) of these different forms of energy are critical in building understanding. It is also important to realize that one model may show several types of energy Mechanical: engines, wind-up toys, CD players Light: Sun, lamp, flashlight, fire Sound: television, CD player, phone, voice Heat/thermal: Sun, lamp, flashlight, fire, oven Including: solar energy –connection as the energy that runs the water cycle	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 www.FossWeb.com Matter and Energy Modules 1 and 2 Duplication Masters www.FossWeb.com Physics of Sound Module 2 Duplication Masters BrainPOP, Jr Energy: Heat, Light and Sound
NEW TEKS: **3.6 Force, motion, and energy. The student knows that forces cause change and that energy exists in many forms.** 3.6b demonstrate and observe how position and motion can be changed by pushing and pulling objects to show work being done such as swings, balls, pulleys, and wagons CURRENT TEKS **3.6 Science concepts. The student knows that forces cause change.** 3.6a measure and record changes in the position and direction of the motion of an object to which a force such as a push or pull has been applied	Including • A force is a push or a pull (natural or man made) • Forces can cause motion (a change in position) over time Such as: Pulling a wagon Raising the flag on the school flag pole A block on a spring scale Kicking a ball Pushing a swing Running water Wind blowing Forces can stop motion or change its direction Such as Catching a ball	

	Hitting a ball Friction and gravity are forces that affect motion Work is done when movement occurs Simple machines make work easier by changing force applied (see system TEKS) Don't TEACH the simply machines in isolation as "a unit" but focus on how they connect with force/motion Such as Pulleys Levers Wheels and axles	TAKSscopes Force and Motion AIMS 3rd Grade Texas Core Curriculum Physical Science Book "Teed Up to Measure" "Give the Car a Push" "Football Forces" "Slingshot Sedans" United Streaming Facts About Forces (0.00-1.08)
NEW TEKS: **3.6 Force, motion, and energy. The student knows that forces cause change and that energy exists in many forms.** 3.6c observe forces such as magnetism and gravity acting on objects	Students need to understand that attraction and repulsion are forms of energy. Model why opposite poles attract and like poles repel. Investigate the role of gravity in both the Sun – Earth – Moon system and the solar system. Frequent misconception: students relate gravity to magnetism. They think that the pull of gravity is the same type of pull as magnetism, and confuse the two.	TAKSscopes **Classifying Matter** o Explore activity - students search for buried materials with magnets AIMS 3rd Grade Texas Core Curriculum Physical Science Book "What is Attracted to a Magnet?" "Magnets Are Attractive" "Sorting Challenge" "How Close Can You Get?" "Face to Face" "Magnetic Motion" "Floating Magnets"
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 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 CURRENT TEKS **3.1 Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and**	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]	PISD Safety Website -Safety Contracts, games, etc -Science Safety is Elementary (for teachers) -Safety in the Elementary Classroom (for teachers) DuPont Science Safety Zone website Texas Science Safety Standards

ethical practices. 3.1a demonstrate safe practices during field and laboratory investigations. 3.1b make wise choices in the use and conservation of resources and the disposal or recycling of materials		
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. Teacher model the investigative / decision making process using the Think-Aloud technique 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. 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. Develop questions using resources such as Science Notebooks, KLEW charts and students sharing with one another EX: How does shade affect outdoor temperatures? 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	
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**	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	

methods during field and laboratory investigations. 3.2b collect information by observing and measuring		
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, 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	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. 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:	Continue to support building understanding of using a systematic	

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	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: EX of Critical Questioning: How does the evidence from our investigations show that the Sun provides heat energy to the Earth? OR Does the Sun's heat or light energy cause the radiometer to move? Student should use and reference their Science Notebooks and one another	
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.** 3.3c represent the natural world using models and identify their limitations	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 **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: **3.4 Scientific investigation and reasoning. The student knows how to use a variety of tools and methods to**	Metric units of measurement only Double pan balance with and without weights, platform scale, spring scales, meter sticks, rulers, timing devices including clocks	

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 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	and stop watches, beakers, graduated cylinders, hand lenses, magnets, notebooks May need to include additional materials to create ramps and small cars or other items to roll on ramps **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. 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.	