



Teacher Resource Guide

1.0 INTRODUCTION

The Infinite Power of Texas Units of Study were developed by the Texas State Energy Conservation Office (SECO) to provide educational resources for K-12 teachers on renewable energy and energy efficiency. The units introduce students to concepts such as solar, wind and biomass energy, energy conservation in the home and alternative vehicle power. The units were created to address four grade-level groups: grades K-3 (primary elementary units), grades 4 and 5 (intermediate elementary units); grades 6, 7, and 8 (middle school units) and grades 9-12 (high school units). This document provides an overview of the K-3 elementary units of Study. It describes the general structure of the units; explains in more detail some instructions provided in the units; identifies Texas Essential Knowledge and Skills (TEKS) addressed by each Unit; provides resources needed to complete the units, including recommended Internet and other resources; and presents guidelines for creating rubrics.

2.0 STRUCTURE AND ORGANIZATION OF UNITS

SECTION	DESCRIPTION
Overview	Summarizes the topic of the lesson and the activities involved.
Objective	Provides the overarching objective of the unit.
Suggested Timeframe	Provides a daily breakdown of activities involved in the Unit of Study, including the estimated amount of time each activity requires, the activity title, the content area and part of the 5-E learning cycle.
Materials for the Week	Materials needed for the various activities included in the unit.
Daily Activities	Detailed instructions of each activity included in the Unit of Study.

3.0 CONCEPTUAL FRAMEWORK FOR INSTRUCTION

3.1 The Learning Cycle

Over the years, there have been many versions of the learning cycle; however, for purposes of this curriculum, the 5-E learning cycle is used as a method for planning. The 5-E learning cycle was developed by the Biological Sciences Curriculum Studies (BSCS) in the late 1980s. Each E represents part of the process of helping students sequence their learning experiences to build their understanding of concepts. First, students are engaged by an event or question related to the concept that the teacher plans to introduce. Then the students participate in one or more activities to explore the concept. This exploration provides students with a common set of experiences from which they can initiate the development of their understanding. In the “explain” phase, the teacher clarifies the concept and defines relevant vocabulary. Then the students elaborate and build on their understanding

of the concept by applying it to new situations. Finally, the students complete activities that will help them and the teacher evaluate their understanding of the concept (www.bsos.org, 2007). This 5-E model is based on a constructivist philosophy of learning (Trowbridge & Bybee, 1990).

3.2 Using Big Words with Young Children

Students learn vocabulary indirectly when they hear and see words used in many different contexts. They also learn vocabulary directly when they are explicitly taught both individual words and word-learning strategies. The National Institute for Literacy suggests that extending instruction that promotes active engagement with vocabulary and repeating exposure to vocabulary in many contexts aids word learning (<http://www.nifl.gov/nifl/publications.html>). Science provides a wealth of opportunity for building vocabulary indirectly and directly with young children. The “big words” of science often are interesting to students, who like to say them and read them within the context of learning new concepts. It is suggested that the teacher create a “word wall” for students in the classroom with words from the glossary included in this guide. In this way, students can refer to the word wall for oral and written communication, thereby using words often for repeated exposure.

3.3 From Awareness to Citizenship

Science is naturally connected to other disciplines, especially mathematics, literacy and social science. In these units, students experience science along with connections to other disciplines; but as the units progress, students move through four stages of concept development, from awareness to citizenship. These four stages include: (1) awareness--teaching the basic science concepts that children need to understand how natural systems work; (2) respect--nurturing children’s respect for the natural environment; (3) problem solving and critical thinking--facilitating problem solving, decision-making and critical thinking; and (4) citizenship--modeling environmental stewardship.

Awareness allows young children to participate in concrete, contextual experiences that are meaningful and relevant. As teachers facilitate learning through exploratory centers, young children learn how the world works

so that their basic knowledge is based on scientific theory and facts, not misconceptions. Unit of Study #1 allows students to explore the concept of energy as it relates to their body and the world around them. Unit of Study #2 continues to bring energy into focus as they explore and examine energy use in their school and at home.

Learning about renewable energy also means that young children need to learn to respect the natural environment, to understand why this topic is important for the future and why it is necessary for scientists and the citizenry to work diligently to decrease our dependence on fossil fuels. Unit of Study #3 allows students to explore renewable versus non-renewable sources of energy so that they can understand where each comes from and its place in the natural world.

Science and scientific discovery does not come without controversy, differences of opinion and varied perspectives. It is important for children to learn critical thinking and problem solving skills at an early age. In Unit of Study #4, 2nd and 3rd grade students will begin to examine the processes associated with decision-making for themselves and their communities.

And finally, young children are never too young to do something for someone else or teach someone else something they have learned. In Unit of Study #5, ideas are provided for teachers so that students can share or advocate what they’ve learned.

This model allows teachers to continually build on previous lessons or units and develop students that can begin to see how disciplines are integrated and how complex the concept of energy is.

3.4 Involving Parents in Science

With any learning, but especially science learning, it is important for parents to know what is being taught and understand the basic constructs so that they can help children with questions asked at home. A couple of the units involve some type of “homework,” so that students can make energy connections with their home environment; the resource guide provides a final solar energy activity that can be done at home. However, the glossary and “fact sheets” should be sent home as well, so that parents can learn more about energy and energy issues.

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3.5 Assessment and Science Notebooks

Assessment is a set of information gathered about students in the classroom and is critical to any curricular endeavor. Throughout the units are questions, “look fors,” writing connections and other informal assessments.

One type of assessment system used throughout the guide is the science notebook. As teachers involve students in inquiry-based science, students are encouraged to communicate their understanding of concepts through science notebook writings. Using science notebooks also can strengthen students’ language skills as they develop an understanding of the world around them. The science

notebook can be any type of composition book or journal: its primary purpose is to allow individual students to document their observations, findings, and interpretations.

Science notebooks typically contain information about the students’ classroom experiences and are encouraged to use them as scientists would, before, during and after all investigations. They can be used to formulate and record questions, make predictions, record data, procedures and results, compose reflections and communicate findings. Most importantly, notebooks provide a place for students to record new concepts they have learned. For more information about science notebooks, visit www.sciencenotebooks.org.

4.0 TEKS

TEKS Grade K	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
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§110.2 ENGLISH LANGUAGE ARTS AND READING, GRADE K

1	Listening/speaking/purposes. The student listens attentively and engages actively in a variety of oral language experiences. The student is expected to:					
	(A) determine the purpose(s) for listening such as to get information, solve problems and enjoy and appreciate (K-3);	X	X	X	X	X
	(B) respond appropriately and courteously to directions and questions (K-3);	X	X	X	X	X
3	Listening/speaking/audiences/oral grammar. The student speaks appropriately to different audiences for different purposes and occasions. The student is expected to:					
	(C) ask and answer relevant questions and make contributions in small or large group discussions (K-3);		X		X	
4	Listening/speaking/communication. The student communicates clearly by putting thoughts and feelings into spoken words. The student is expected to:					
	(A) learn the vocabulary of school such as numbers, shapes, colors, directions and categories (K-1);	X	X	X	X	X
	(C) clarify and support spoken messages using appropriate props such as objects, pictures or charts (K-3); and	X	X	X	X	X
8	Reading/vocabulary development. The student develops an extensive vocabulary. The student is expected to:					
	(A) discuss meanings of words and develop vocabulary through meaningful/concrete experiences (K-2);	X	X	X	X	X
12	Reading/inquiry/research. The student generates questions and conducts research about topics introduced through selections read aloud and from a variety of other sources. The student is expected to:					
	(A) identify relevant questions for inquiry such as “Why did knights wear armor?” (K-3);	X	X	X	X	X
	(B) use pictures, print, and people to gather information and answer questions (K-1);	X	X	X	X	X
	(C) draw conclusions from information gathered (K-3); and	X	X	X	X	X

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TEKS Grade K	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§110.2 ENGLISH LANGUAGE ARTS AND READING, GRADE K (continued)						
15	Writing/composition. The student composes original texts. The student is expected to:					
	(B) write labels, notes, and captions for illustrations, possessions, charts, centers (K-1);	X	X	X	X	X
	(C) write to record ideas and reflections (K-3);	X	X	X	X	X
	(D) generate ideas before writing on self-selected topics (K-1);		X			
	(E) generate ideas before writing on assigned tasks (K-1); and		X		X	X
	(F) use available technology to compose text (K-3).		X		X	X
16	Writing/inquiry/research. The student uses writing as a tool for learning and research. The student is expected to:					
	(A) record or dictate questions for investigating (K-1); and	X	X	X	X	X
	(B) record or dictate his/her own knowledge of a topic in various ways such as by drawing pictures, making lists and showing connections among ideas (K-3).	X	X	X	X	X

§111.12 MATHEMATICS, GRADE K

K.2	Number, operation, and quantitative reasoning. The student describes order of events or objects. The student is expected to:					
	(A) use language such as before or after to describe relative position in a sequence of events or objects; and	X	X		X	
K.5	Patterns, relationships, and algebraic thinking. The student identifies, extends, and creates patterns. The student is expected to identify, extend and create patterns of sounds, physical movement and concrete objects.	X				
K.6	Patterns, relationships, and algebraic thinking. The student uses patterns to make predictions. The student is expected to:					
	(A) use patterns to predict what comes next, including cause-and-effect relationships; and	X				
K.7	Geometry and spatial reasoning. The student describes the relative positions of objects. The student is expected to:					
	(A) describe one object in relation to another using informal language such as over, under, above and below; and	X				
	(B) place an object in a specified position.	X				
K.10	Measurement. The student directly compares the attributes of length, area, weight/ mass, capacity and/or relative temperature. The student uses comparative language to solve problems and answer questions. The student is expected to:					
	(A) compare and order two or three concrete objects according to length (longer/ shorter than, or the same);	X				
	(D) compare two objects according to weight/mass (heavier than, lighter than or equal to); and	X				
	(E) compare situations or objects according to relative temperature (hotter/colder than, or the same as).	X		X		
K.11	Measurement. The student uses time to describe, compare and order events and situations. The student is expected to:					
	(A) compare events according to duration such as more time than or less time than;	X				
	(B) sequence events (up to three); and	X	X	X	X	

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TEKS Grade K	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§111.12 MATHEMATICS, GRADE K (continued)						
K.12	Probability and statistics. The student constructs and uses graphs of real objects or pictures to answer questions. The student is expected to:					
	(A) construct graphs using real objects or pictures in order to answer questions; and	X	X	X	X	
	(B) use information from a graph of real objects or pictures in order to answer questions.	X	X	X	X	
K.13	Underlying processes and mathematical tools. The student applies Kindergarten mathematics to solve problems connected to everyday experiences and activities in and outside of school. The student is expected to:					
	(A) identify mathematics in everyday situations;	X	X	X	X	X
	(B) solve problems with guidance that incorporates the processes of understanding the problem, making a plan, carrying out the plan and evaluating the solution for reasonableness;	X	X	X	X	X
	(D) use tools such as real objects, manipulatives and technology to solve problems.	X	X	X	X	X
K.14	Underlying processes and mathematical tools. The student communicates about Kindergarten mathematics using informal language. The student is expected to:					
	(A) communicate mathematical ideas using objects, words, pictures, numbers and technology; and	X	X	X	X	X
	(B) relate everyday language to mathematical language and symbols.	X	X	X	X	X
K.15	Underlying processes and mathematical tools. The student uses logical reasoning. The student is expected to justify his or her thinking using objects, words, pictures, numbers and technology.	X	X	X	X	X

§112.2 SCIENCE, GRADE K

1	Scientific processes. The student participates in classroom and field investigations following home and school safety procedures. The student is expected to:					
	(A) demonstrate safe practices during classroom and field investigations; and	X	X	X	X	X
	(B) learn how to use and conserve resources and materials.	X	X	X	X	X
2	Scientific processes. The student develops abilities necessary to do scientific inquiry in the field and the classroom. The student is expected to:					
	(A) ask questions about organisms, objects and events;	X	X	X	X	X
	(B) plan and conduct simple descriptive investigations;	X	X	X	X	X
	(C) gather information using simple equipment and tools to extend the senses;	X	X	X	X	X
	(D) construct reasonable explanations using information; and	X	X	X	X	X
	(E) communicate findings about simple investigations.	X	X	X	X	X
3	Scientific processes. The student knows that information and critical thinking are used in making decisions. The student is expected to:					
	(A) make decisions using information;		X		X	X
	(B) discuss and justify the merits of decisions; and		X		X	X
	(C) explain a problem in his/her own words and propose a solution.	X	X	X	X	X
4	Scientific processes. The student uses age-appropriate tools and models to verify that organisms and objects and parts of organisms and objects can be observed, described and measured. The student is expected to:					
	(A) identify and use senses as tools of observation; and	X	X	X	X	X
	(B) make observations using tools including hand lenses, balances, cups, bowls, and computers.	X				

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TEKS Grade K	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§112.2 SCIENCE, GRADE K (continued)						
5	Science concepts. The student knows that organisms, objects, and events have properties and patterns. The student is expected to: (C) recognize and copy patterns seen in charts and graphs.	X	X	X	X	
7	Science concepts. The student knows that many types of change occur. The student is expected to: (A) observe, describe, and record changes in size, mass, color, position, quantity, time, temperature, sound and movement; (B) identify that heat causes change, such as ice melting or the sun warming the air and compare objects according to temperature;	X		X		
9	Science concepts. The student knows that living organisms have basic needs. The student is expected to: (C) identify ways that the Earth can provide resources for life.	X	X	X	X	X
10	Science concepts. The student knows that the natural world includes rocks, soil and water. The student is expected to: (B) give examples of ways that rocks, soil and water are useful.			X	X	

§113.2 SOCIAL STUDIES, GRADE K

2	History. The student understands how historical figures and ordinary people helped to shape the community, state, and nation. The student is expected to: (B) identify ordinary people who have shaped the community.				X	
4	Geography. The student understands the concept of location. The student is expected to: (A) use terms, including over, under, near, far, left and right, to describe relative location; and (B) locate places on the school campus and describe their relative locations.		X		X	
6	Economics. The student understands that basic human needs are met in many ways. The student is expected to: (A) identify basic human needs; and			X		X
7	Economics. The student understands the importance of jobs. The student is expected to: (A) identify jobs in the home, school and community; and (B) explain why people have jobs.		X		X	
8	Government. The student understands the purpose of rules. The student is expected to: (A) identify purposes for having rules; and (B) identify rules that provide order, security, and safety in the home and school.					X
9	Government. The student understands the role of authority figures. The student is expected to: (A) identify authority figures in the home, school and community; and (B) explain how authority figures make and enforce rules.					X
13	Science, technology and society. The student understands ways technology is used in the home and school. The student is expected to: (A) identify examples of technology used in the home and school; and (B) describe how technology helps accomplish specific tasks.	X	X	X		X

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TEKS Grade K	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§113.2 SOCIAL STUDIES, GRADE K (continued)						
14	Science, technology and society. The student understands ways in which technology has changed how people live. The student is expected to:					
	(A) describe how his or her life might be different without modern technology; and		X		X	X
	(B) list ways in which technology meets people’s needs.		X		X	X
15	Social studies skills. The student applies critical-thinking skills to organize and use information acquired from a variety of sources including electronic technology. The student is expected to:					
	(A) obtain information about a topic using a variety of oral sources such as conversations, interviews and music;		X		X	
	(B) obtain information about a topic using a variety of visual sources such as pictures, symbols, television, maps, computer images, print material and artifacts;		X	X	X	
	(C) sequence and categorize information; and			X		
	(D) identify main ideas from oral, visual and print sources.				X	
17	Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others, in a variety of settings. The student is expected to:					
	(A) use a problem-solving process to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution and evaluate its effectiveness; and				X	X
	(B) use a decision-making process to identify a situation that requires a decision, gather information, identify options, predict consequences and take action to implement a decision.				X	X

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TEKS Grade 1	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
110.3 ENGLISH LANGUAGE ARTS AND READING, GRADE 1						
1	Listening/speaking/purposes. The student listens attentively and engages actively in a variety of oral language experiences. The student is expected to:					
	(A) determine the purpose(s) for listening such as to get information, solve problems and enjoy and appreciate (K-3);	X	X	X	X	X
	(B) respond appropriately and courteously to directions and questions (K-3);	X	X	X	X	X
	(D) listen critically to interpret and evaluate (K-3);		X		X	
3	Listening/speaking/audiences/oral grammar. The student speaks appropriately to different audiences for different purposes and occasions. The student is expected to:					
	(C) ask and answer relevant questions and make contributions in small or large group discussions (K-3);		X		X	
4	Listening/speaking/communication. The student communicates clearly by putting thoughts and feelings into spoken words. The student is expected to:					
	(A) learn the vocabulary of school such as numbers, shapes, colors, directions and categories (K-1);	X	X	X	X	X
	(C) clarify and support spoken messages using appropriate props such as objects, pictures and charts (K-3); and	X	X	X	X	X
10	Reading/variety of texts. The student reads widely for different purposes in varied sources. The student is expected to:					
	(B) use graphs, charts, signs, captions and other informational texts to acquire information (1).	X				
11	Reading/vocabulary development. The student develops an extensive vocabulary. The student is expected to:					
	(A) discuss meanings of words and develop vocabulary through meaningful/ concrete experiences (K-2);	X	X	X	X	X
15	Reading/inquiry/research. The student generates questions and conducts research about topics using information from a variety of sources, including selections read aloud. The student is expected to:					
	(A) identify relevant questions for inquiry such as “What do pill bugs eat?” (K-3);	X	X	X	X	X
	(B) use pictures, print, and people to gather information and answer questions (K-1);	X	X	X	X	X
	(C) draw conclusions from information gathered (K-3);	X	X	X	X	X
18	Writing/purposes. The student writes for a variety of audiences and purposes and in a variety of forms. The student is expected to:					
	(B) write labels, notes and captions for illustrations, possessions, charts, and centers (K-1);	X	X	X	X	X
	(C) write to record ideas and reflections (K-3);	X	X	X	X	X
	(D) write to discover, develop and refine ideas (1-3);	X	X	X	X	X
	(E) write to communicate with a variety of audiences (1-3); and		X			X
	(F) write in different forms for different purposes such as lists to record, letters to invite or thank and stories or poems to entertain (1-3).		X		X	X

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TEKS Grade 1	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
110.3 ENGLISH LANGUAGE ARTS AND READING, GRADE 1 (continued)						
19	Writing/writing processes. The student selects and uses writing processes to compose original text. The student is expected to:					
	(A) generate ideas before writing on self-selected topics (K-1);				X	X
	(B) generate ideas before writing on assigned tasks (K-1);					X
	(C) develop drafts (1-3);		X		X	X
	(D) revise selected drafts for varied purposes, including to achieve a sense of audience, precise word choices and vivid images (1-3); and					X
	(E) use available technology to compose text (K-3).		X			X
23	Writing/inquiry/research. The student uses writing as a tool for learning and research. The student is expected to:					
	(A) record or dictate questions for investigating (K-1); and	X	X	X	X	X
	(B) record or dictate his/her own knowledge of a topic in various ways such as by drawing pictures, making lists and showing connections among ideas (K-3).	X	X	X	X	X

§112.2 MATHEMATICS, GRADE 1

1.7	Measurement. The student directly compares the attributes of length, area, weight/mass, capacity and temperature. The student uses comparative language to solve problems and answer questions. The student selects and uses nonstandard units to describe length. The student is expected to:					
	(A) estimate and measure length using nonstandard units such as paper clips or sides of color tiles;	X				
	(C) describe the relationship between the size of the unit and the number of units needed to measure the length of an object;	X				
1.9	Probability and statistics. The student displays data in an organized form. The student is expected to:					
	(A) collect and sort data; and	X		X		
	(B) use organized data to construct real-object graphs, picture graphs and bar-type graphs.	X		X		
1.1	Probability and statistics. The student uses information from organized data. The student is expected to:					
	(B) identify events as certain or impossible such as drawing a red crayon from a bag of green crayons.			X		
1.12	Underlying processes and mathematical tools. The student communicates about Grade 1 mathematics using informal language. The student is expected to:					
	(A) explain and record observations using objects, words, pictures, numbers and technology; and	X	X	X	X	X
	(B) relate informal language to mathematical language and symbols.	X	X	X	X	X
1.13	Underlying processes and mathematical tools. The student uses logical reasoning. The student is expected to justify his or her thinking using objects, words, pictures, numbers and technology.	X	X	X	X	X

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TEKS Grade 1	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§112.3 SCIENCE, GRADE 1						
1	Scientific processes. The student conducts classroom and field investigations following home and school safety procedures. The student is expected to:					
	(A) demonstrate safe practices during classroom and field investigations; and	X	X	X	X	X
	(B) learn how to use and conserve resources and materials.	X	X	X	X	X
2	Scientific processes. The student develops abilities to do scientific inquiry in the field and the classroom. The student is expected to:					
	(A) ask questions about organisms, objects and events;	X	X	X	X	X
	(B) plan and conduct simple descriptive investigations;	X		X		X
	(C) gather information using simple equipment and tools to extend the senses;	X		X		X
	(D) construct reasonable explanations and draw conclusions; and	X	X	X	X	X
	(E) communicate explanations about investigations.	X	X	X	X	X
3	Scientific processes. The student knows that information and critical thinking are used in making decisions. The student is expected to:					
	(A) make decisions using information;		X		X	X
	(B) discuss and justify the merits of decisions; and		X		X	X
	(C) explain a problem in his/her own words and identify a task and solution related to the problem.	X	X		X	X
4	Scientific processes. The student uses age-appropriate tools and models to verify that organisms and objects and parts of organisms and objects can be observed, described and measured. The student is expected to:					
	(A) collect information using tools including hand lenses, clocks, computers, thermometers and balances;	X		X		
5	Science concepts. The student knows that organisms, objects and events have properties and patterns. The student is expected to:					
	(A) sort objects and events based on properties and patterns; and		X	X		
	(B) identify, predict and create patterns including those seen in charts, graphs, and numbers.		X	X	X	
7	Science concepts. The student knows that many types of change occur. The student is expected to:					
	(A) observe, measure and record changes in size, mass, color, position, quantity, sound and movement;	X		X		
	(B) identify and test ways that heat may cause change, such as when ice melts;	X		X		
10	Science concepts. The student knows that the natural world includes rocks, soil and water. The student is expected to:					
	(C) identify how rocks, soil and water are used and how they can be recycled.			X	X	

§113.3 SOCIAL STUDIES, GRADE 1

4	Geography. The student understands the relative location of places. The student is expected to:					
	(B) describe the location of self and objects relative to other locations in the classroom and school.		X			
5	Geography. The student understands the purpose of maps and globes. The student is expected to:					
	(A) create and use simple maps to identify the location of places in the classroom, school, community and beyond; and		X			

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TEKS Grade 1	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§113.3 SOCIAL STUDIES, GRADE 1 (continued)						
7	Economics. The student understands the concepts of goods and services. The student is expected to:					
	(A) identify examples of goods and services in the home, school and community;		X		X	X
8	Economics. The student understands the condition of not being able to have all the goods and services one wants. The student is expected to:					
	(B) explain why wanting more than they can have requires that people make choices; and				X	
	(C) identify examples of choices families make when buying goods and services.				X	
10	Government. The student understands the purpose of rules and laws. The student is expected to:					
	(A) explain the need for rules and laws in the home, school and community; and			X	X	X
	(B) give examples of rules or laws that establish order, provide security and manage conflict.					X
11	Government. The student understands the role of authority figures and public officials. The student is expected to:					
	(C) identify the responsibilities of authority figures in the home, school and community.		X		X	X
12	Citizenship. The student understands characteristics of good citizenship as exemplified by historic figures and ordinary people. The student is expected to:					
	(A) identify characteristics of good citizenship such as a belief in justice, truth, equality and responsibility for the common good;					X
16	Science, technology, and society. The student understands how technology has affected daily life, past and present. The student is expected to:					
	(A) describe how household tools and appliances have changed the ways families live;		X	X	X	X
	(B) describe how technology has changed communication, transportation, and recreation; and		X	X	X	X
	(C) describe how technology has changed the way people work.		X	X	X	X
17	Social studies skills. The student applies critical-thinking skills to organize and use information acquired from a variety of sources including electronic technology. The student is expected to:					
	(B) obtain information about a topic using a variety of visual sources such as pictures, graphics, television, maps, computer images, literature and artifacts;				X	
	(D) identify main ideas from oral, visual and print sources.				X	
18	Social studies skills. The student communicates in written, oral and visual forms. The student is expected to:					
	(A) express ideas orally based on knowledge and experiences; and	X	X	X	X	X
	(B) create visual and written material including pictures, maps, timelines and graphs.		X		X	
19	Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others, in a variety of settings. The student is expected to:					
	(A) use a problem-solving process to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution and evaluate its effectiveness; and		X		X	X
	(B) use a decision-making process to identify a situation that requires a decision, gather information, identify options, predict consequences and take action to implement a decision.		X		X	X

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TEKS Grade 2	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§110.4. English Language Arts and Reading, GRADE 2						
1	Listening/speaking/purposes. The student listens attentively and engages actively in a variety of oral language experiences. The student is expected to:					
	(A) determine the purpose(s) for listening such as to get information, to solve problems, and to enjoy and appreciate (K-3);	X	X	X	X	X
	(B) respond appropriately and courteously to directions and questions (K-3);	X	X	X	X	X
	(D) listen critically to interpret and evaluate (K-3);		X		X	
4	Listening/speaking/communication. The student communicates clearly by putting thoughts and feelings into spoken words. The student is expected to:					
	(A) use vocabulary to describe clearly ideas, feelings and experiences (K-3);					
	(B) clarify and support spoken messages using appropriate props such as objects, pictures or charts (K-3); and	X	X	X	X	
	(C) retell a spoken message by summarizing or clarifying (K-3).		X		X	
8	Reading/vocabulary development. The student develops an extensive vocabulary. The student is expected to:					
	(A) discuss meanings of words and develop vocabulary through meaningful/concrete experiences (K-2);	X				
12	Reading inquiry/research. The student generates questions and conducts research using information from various sources. The student is expected to:					
	(A) identify relevant questions for inquiry such as “Why do birds build different kinds of nests?” (K-3);	X	X	X	X	X
	(D) use multiple sources, including print such as an encyclopedia, technology, and experts, to locate information that addresses questions (2-3);		X	X	X	X
	(E) interpret and use graphic sources of information such as maps, charts, graphs and diagrams (2-3);	X		X		
	(G) demonstrate learning through productions and displays such as murals, written and oral reports and dramatizations (2-3); and		X			
14	Writing/purposes. The student writes for a variety of audiences and purposes and in various forms. The student is expected to:					
	(A) write to record ideas and reflections (K-3);	X	X	X	X	X
	(B) write to discover, develop and refine ideas (1-3);	X	X	X	X	X
	(C) write to communicate with a variety of audiences (1-3); and	X	X	X	X	X
	(D) write in different forms for different purposes such as lists to record, letters to invite or thank and stories or poems to entertain (1-3).	X	X	X	X	X
18	Writing/writing processes. The student selects and uses writing processes for self-initiated and assigned writing. The student is expected to:					
	(A) generate ideas for writing by using prewriting techniques such as drawing and listing key thoughts (2-3);				X	X
	(B) develop drafts (1-3);		X		X	X
	(C) revise selected drafts for varied purposes, including to achieve a sense of audience, precise word choices and vivid images (1-3);				X	X
	(D) edit for appropriate grammar, spelling, punctuation, and features of polished writings (2-3);				X	X
	(E) use available technology for aspects of writing, including word processing, spell checking and printing (2-3); and		X		X	X
	(F) demonstrate understanding of language use and spelling by bringing selected pieces frequently to final form and “publishing” them for audiences (2-3).				X	X

TEACHER RESOURCE GUIDE

TEKS Grade 2	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
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§110.4. English Language Arts and Reading, GRADE 2 (continued)

20	<p>Writing/inquiry/research. The student uses writing as a tool for learning and research. The student is expected to:</p> <p>(A) write or dictate questions for investigating (2-3);</p> <p>(B) record his/her own knowledge of a topic in various ways such as by drawing pictures, making lists, and showing connections among ideas (K-3);</p> <p>(C) take simple notes from relevant sources such as classroom guests, information books and media sources (2-3); and</p> <p>(D) compile notes into outlines, reports, summaries, or other written efforts using available technology (2-3).</p>	X	X	X	X	X
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§111.14. Mathematics, GRADE 2

2.9	<p>Measurement. The student directly compares the attributes of length, area, weight/mass, and capacity, and uses comparative language to solve problems and answer questions. The student selects and uses nonstandard units to describe length, area, capacity and weight/mass. The student recognizes and uses models that approximate standard units (from both SI, also known as metric, and customary systems) of length, weight/mass, capacity and time. The student is expected to:</p> <p>(C) select a non-standard unit of measure such as a bathroom cup or a jar to determine the capacity of a given container; and</p> <p>(D) select a non-standard unit of measure such as beans or marbles to determine the weight/mass of a given object.</p>	X				
2.1	<p>Measurement. The student uses standard tools to estimate and measure time and temperature (in degrees Fahrenheit). The student is expected to:</p> <p>(A) read a thermometer to gather data;</p> <p>(C) describe activities that take approximately one second, one minute, and one hour.</p>			X		
2.11	<p>Probability and statistics. The student organizes data to make it useful for interpreting information. The student is expected to:</p> <p>(A) construct picture graphs and bar-type graphs;</p> <p>(B) draw conclusions and answer questions based on picture graphs and bar-type graphs; and</p> <p>(C) use data to describe events as more likely or less likely such as drawing a certain color crayon from a bag of seven red crayons and three green crayons.</p>	X	X	X		
2.12	<p>Underlying processes and mathematical tools. The student applies Grade 2 mathematics to solve problems connected to everyday experiences and activities in and outside of school. The student is expected to:</p> <p>(A) identify the mathematics in everyday situations;</p> <p>(B) solve problems with guidance that incorporates the processes of understanding the problem, making a plan, carrying out the plan and evaluating the solution for reasonableness;</p> <p>(C) select or develop an appropriate problem-solving plan or strategy, including drawing a picture, looking for a pattern, systematic guessing and checking or acting it out in order to solve a problem; and</p> <p>(D) use tools such as real objects, manipulatives and technology to solve problems.</p>	X	X	X	X	X

TEACHER RESOURCE GUIDE

TEKS Grade 2	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
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§111.14. Mathematics, GRADE 2 (continued)

2.13	<p>Underlying processes and mathematical tools. The student communicates about Grade 2 mathematics using informal language. The student is expected to:</p> <p>(A) explain and record observations using objects, words, pictures, numbers and technology; and</p> <p>(B) relate informal language to mathematical language and symbols.</p>	X	X	X	X	X
2.14	<p>Underlying processes and mathematical tools. The student uses logical reasoning. The student is expected to justify his or her thinking using objects, words, pictures, numbers and technology.</p>	X	X	X	X	X

§112.4. Science, GRADE 2

1	<p>Scientific processes. The student conducts classroom and field investigations following home and school safety procedures. The student is expected to:</p> <p>(A) demonstrate safe practices during classroom and field investigations; and</p> <p>(B) learn how to use and conserve resources and dispose of materials.</p>	X	X	X	X	X
2	<p>Scientific processes. The student develops abilities necessary to do scientific inquiry in the field and the classroom. The student is expected to:</p> <p>(A) ask questions about organisms, objects and events;</p> <p>(B) plan and conduct simple descriptive investigations;</p> <p>(C) compare results of investigations with what students and scientists know about the world;</p> <p>(D) gather information using simple equipment and tools to extend the senses;</p> <p>(E) construct reasonable explanations and draw conclusions using information and prior knowledge; and</p> <p>(F) communicate explanations about investigations.</p>	X	X	X	X	X
3	<p>Scientific processes. The student knows that information and critical thinking are used in making decisions. The student is expected to:</p> <p>(A) make decisions using information;</p> <p>(B) discuss and justify the merits of decisions; and</p> <p>(C) explain a problem in his/her own words and identify a task and solution related to the problem.</p>	X	X	X	X	X
4	<p>Scientific processes. The student uses age-appropriate tools and models to verify that organisms and objects and parts of organisms and objects can be observed, described and measured. The student is expected to:</p> <p>(A) collect information using tools including rulers, meter sticks, measuring cups, clocks, hand lenses, computers, thermometers and balances; and</p>	X	X	X	X	X
5	<p>Science concepts. The student knows that organisms, objects, and events have properties and patterns. The student is expected to:</p> <p>(A) classify and sequence organisms, objects and events based on properties and patterns; and</p> <p>(B) identify, predict, replicate, and create patterns including those seen in charts, graphs and numbers.</p>	X	X	X	X	X

TEACHER RESOURCE GUIDE

TEKS Grade 2	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
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§112.4. Science, GRADE 2 (continued)

7	<p>Science concepts. The student knows that many types of change occur. The student is expected to:</p> <p>(A) observe, measure, record, analyze, predict, and illustrate changes in size, mass, temperature, color, position, quantity, sound and movement;</p> <p>(B) identify, predict, and test uses of heat to cause change such as melting and evaporation;</p> <p>(C) demonstrate a change in the motion of an object by giving the object a push or a pull; and</p>	X		X		
10	<p>Science concepts. The student knows that the natural world includes rocks, soil, water and gases of the atmosphere. The student is expected to:</p> <p>(B) identify uses of natural resources.</p>	X			X	X

§113.4. Social Studies, GRADE 2

5	<p>Geography. The student uses simple geographic tools such as maps, globes and photographs. The student is expected to:</p> <p>(A) use symbols, find locations and determine directions on maps and globes; and</p>		X			
8	<p>Geography. The student understands how humans use and modify the physical environment. The student is expected to:</p> <p>(A) identify ways in which people depend on the physical environment, including natural resources, to meet basic needs;</p> <p>(B) identify ways in which people have modified the physical environment such as building roads, clearing land for urban development and mining coal;</p> <p>(D) identify ways people can conserve and replenish natural resources.</p>	X	X	X	X	X
10	<p>Economics. The student understands the roles of producers and consumers in the production of goods and services. The student is expected to:</p> <p>(A) distinguish between producing and consuming;</p> <p>(B) identify ways in which people are both producers and consumers; and</p> <p>(C) trace the development of a product from a natural resource to a finished product.</p>	X	X	X	X	X
11	<p>Government. The student understands the purpose of governments. The student is expected to:</p> <p>(C) describe how governments establish order, provide security and manage conflict.</p>					X
13	<p>Citizenship. The student understands characteristics of good citizenship as exemplified by historic figures and ordinary people. The student is expected to:</p> <p>(A) identify characteristics of good citizenship such as a belief in justice, truth, equality and responsibility for the common good;</p>		X			X
16	<p>Science, technology, and society. The student understands how science and technology have affected life, past and present. The student is expected to:</p> <p>(A) describe how science and technology have changed communication, transportation, and recreation; and</p> <p>(B) explain how science and technology have changed the ways in which people meet basic needs.</p>		X	X	X	X

TEACHER RESOURCE GUIDE

TEKS Grade 2	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§113.4. Social Studies, GRADE 2 (continued)						
17	<p>Social studies skills. The student applies critical-thinking skills to organize and use information acquired from a variety of sources including electronic technology. The student is expected to:</p> <p>(A) obtain information about a topic using a variety of oral sources such as conversations, interviews and music;</p> <p>(B) obtain information about a topic using a variety of visual sources such as pictures, graphics, television, maps, computer software, literature, reference sources and artifacts;</p> <p>(D) sequence and categorize information; and</p>		X		X	
18	<p>Social studies skills. The student communicates in written, oral, and visual forms. The student is expected to:</p> <p>(A) express ideas orally based on knowledge and experiences; and</p> <p>(B) create written and visual material such as stories, poems, maps, and graphic organizers to express ideas.</p>	X	X	X	X	X
19	<p>Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others, in a variety of settings. The student is expected to:</p> <p>(A) use a problem-solving process to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution and evaluate its effectiveness; and</p> <p>(B) use a decision-making process to identify a situation that requires a decision, gather information, identify options, predict consequences and take action to implement a decision.</p>		X		X	X

TEACHER RESOURCE GUIDE

TEKS Grade 3	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§110.5. English Language Arts and Reading, GRADE 3						
1	Listening/speaking/purposes. The student listens attentively and engages actively in various oral language experiences. The student is expected to:					
	(A) determine the purpose(s) for listening, such as to get information, solve problems and enjoy and appreciate (K-3);	X	X	X	X	X
	(B) respond appropriately and courteously to directions and questions (K-3);	X	X	X	X	X
	(C) participate in rhymes, songs, conversations and discussions (K-3);					
	(D) listen critically to interpret and evaluate (K-3);		X		X	
3	Listening/speaking/audiences/oral grammar. The student speaks appropriately to different audiences for different purposes and occasions. The student is expected to:					
	(B) use verbal and nonverbal communication in effective ways such as making announcements, giving directions or making introductions (K-3);		X			
	(C) ask and answer relevant questions and make contributions in small or large group discussions (K-3);	X	X	X	X	X
4	Listening/speaking/communication. The student communicates clearly by putting thoughts and feelings into spoken words. The student is expected to:					
	(B) clarify and support spoken messages using appropriate props, including objects, pictures and charts (K-3); and	X	X	X	X	
	(C) retell a spoken message by summarizing or clarifying (K-3).				X	
12	Reading/inquiry/research. The student generates questions and conducts research using information from various sources. The student is expected to:					
	(A) identify relevant questions for inquiry such as “What Native American tribes inhabit(ed) Texas?” (K-3);	X	X	X	X	X
	(D) use multiple sources including print, such as an encyclopedia, technology and experts, to locate information that addresses questions (2-3);		X	X	X	X
	(E) interpret and use graphic sources of information, including maps, charts, graphs and diagrams (2-3);	X		X		
	(G) organize information in systematic ways, including notes, charts and labels (3);		X		X	
	(H) demonstrate learning through productions and displays such as oral and written reports, murals and dramatizations (2-3);		X		X	
	(I) use compiled information and knowledge to raise additional, unanswered questions (3); and					
	(J) draw conclusions from information gathered (K-3).	X		X	X	
14	Writing/purposes. The student writes for a variety of audiences and purposes and in various forms. The student is expected to:					
	(A) write to record ideas and reflections (K-3);	X	X	X	X	X
	(B) write to discover, develop, and refine ideas (1-3);	X	X	X	X	X
	(C) write to communicate with a variety of audiences (1-3); and	X	X	X	X	X
	(D) write in different forms for different purposes such as lists to record, letters to invite or thank and stories or poems to entertain (1-3).	X	X	X	X	X

TEACHER RESOURCE GUIDE

TEKS Grade 3	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§110.5. English Language Arts and Reading, GRADE 3 (continued)						
18	Writing/writing processes. The student selects and uses writing processes for self-initiated and assigned writing. The student is expected to:					
	(A) generate ideas for writing by using prewriting techniques such as drawing and listing key thoughts (2-3);				X	X
	(B) develop drafts (1-3);		X		X	X
	(C) revise selected drafts for varied purposes, including to achieve a sense of audience, precise word choices and vivid images (1-3);				X	X
	(D) edit for appropriate grammar, spelling, punctuation and features of polished writing (2-3);				X	X
	(E) use available technology for aspects of writing such as word processing, spell checking and printing (2-3); and		X		X	X
	(F) demonstrate understanding of language use and spelling by bringing selected pieces frequently to final form, “publishing” them for audiences (2-3).				X	X
20	Writing/inquiry/research. The student uses writing as a tool for learning and research. The student is expected to:					
	(A) write or dictate questions for investigating (2-3);	X	X	X	X	X
	(B) record his/her own knowledge of a topic in a variety of ways such as by drawing pictures, making lists and showing connections among ideas (K-3);	X	X	X	X	X
	(C) take simple notes from relevant sources such as classroom guests, books and media sources (2-3); and	X	X	X	X	X
	(D) compile notes into outlines, reports, summaries or other written efforts using available technology (2-3).	X	X	X	X	X

§111.15. Mathematics, GRADE 3

3.11	Measurement. The student directly compares the attributes of length, area, weight/mass and capacity, and uses comparative language to solve problems and answer questions. The student selects and uses standard units to describe length, area, capacity/volume and weight/mass. The student is expected to:					
	(D) identify concrete models that approximate standard units of weight/mass and use them to measure weight/mass;	X				
3.12	Measurement. The student reads and writes time and measures temperature in degrees Fahrenheit to solve problems. The student is expected to:					
	(A) use a thermometer to measure temperature; and			X		
3.13	Probability and statistics. The student solves problems by collecting, organizing, displaying and interpreting sets of data. The student is expected to:					
	(A) collect, organize, record and display data in pictographs and bar graphs where each picture or cell might represent more than one piece of data;	X		X		
	(B) interpret information from pictographs and bar graphs; and	X		X		
	(C) use data to describe events as more likely than, less likely than, or equally likely as.	X		X		

TEACHER RESOURCE GUIDE

TEKS Grade 3	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
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§111.15. Mathematics, GRADE 3 (continued)

3.14	<p>Underlying processes and mathematical tools. The student applies Grade 3 mathematics to solve problems connected to everyday experiences and activities in and outside of school. The student is expected to:</p> <p>(A) identify the mathematics in everyday situations;</p> <p>(B) solve problems that incorporate understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;</p> <p>(C) select or develop an appropriate problem-solving plan or strategy, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem or working backwards to solve a problem; and</p> <p>(D) use tools such as real objects, manipulatives and technology to solve problems.</p>	X	X	X	X	X
3.15	<p>Underlying processes and mathematical tools. The student communicates about Grade 3 mathematics using informal language. The student is expected to:</p> <p>(A) explain and record observations using objects, words, pictures, numbers and technology; and</p> <p>(B) relate informal language to mathematical language and symbols.</p>	X	X	X	X	X
3.16	<p>Underlying processes and mathematical tools. The student uses logical reasoning. The student is expected to:</p> <p>(A) make generalizations from patterns or sets of examples and nonexamples; and</p>	X	X	X	X	X

§112.5. Science, GRADE 3

1	<p>Scientific processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:</p> <p>(A) demonstrate safe practices during field and laboratory investigations; and</p> <p>(B) make wise choices in the use and conservation of resources and the disposal or recycling of materials.</p>	X	X	X	X	X
2	<p>Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to:</p> <p>(A) plan and implement descriptive investigations including asking well-defined questions, formulating testable hypotheses and selecting and using equipment and technology;</p> <p>(B) collect information by observing and measuring;</p> <p>(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;</p> <p>(D) communicate valid conclusions; and</p> <p>(E) construct simple graphs, tables, maps and charts to organize, examine and evaluate information.</p>	X	X	X	X	X
3	<p>Scientific processes. The student knows that information, critical thinking and scientific problem solving are used in making decisions. The student is expected to:</p> <p>(B) draw inferences based on information related to promotional materials for products and services;</p> <p>(C) represent the natural world using models and identify their limitations;</p> <p>(D) evaluate the impact of research on scientific thought, society, and the environment; and</p>	X	X	X	X	X

TEACHER RESOURCE GUIDE

TEKS Grade 3	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§112.5. Science, GRADE 3 (continued)						
4	Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry. The student is expected to:					
	(A) 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	X				
5	Science concepts. The student knows that systems exist in the world. The student is expected to:					
	(A) observe and identify simple systems such as a sprouted seed and a wooden toy car; and	X				
	(B) observe a simple system and describe the role of various parts such as a yo-yo and string.	X				
6	Science concepts. The student knows that forces cause change. The student is expected to:					
	(A) 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; and	X				
7	Science concepts. The student knows that matter has physical properties. The student is expected to:					
	(A) gather information including temperature, magnetism, hardness and mass using appropriate tools to identify physical properties of matter; and	X				
11	Science concepts. The student knows that the natural world includes earth materials and objects in the sky. The student is expected to:					
	(A) identify and describe the importance of earth materials including rocks, soil, water and gases of the atmosphere in the local area and classify them as renewable, nonrenewable or inexhaustible resources;	X	X	X	X	X

§113.5. Social Studies, GRADE 3

5	Geography. The student understands the concepts of location, distance, and direction on maps and globes. The student is expected to:					
	(D) draw maps of places and regions that contain map elements including a title, compass rose, legend, scale and grid system.		X			
6	Economics. The student understands the purposes of spending and saving money. The student is expected to:					
	(A) identify ways of earning, spending and saving money; and				X	
7	Economics. The student understands the concept of an economic system. The student is expected to:					
	(B) explain the impact of scarcity on the production, distribution and consumption of goods and services;			X	X	
11	Citizenship. The student understands the impact of individual and group decisions on communities in a democratic society. The student is expected to:					
	(A) give examples of community changes that result from individual or group decisions;		X		X	X
	(B) identify examples of actions individuals and groups can take to improve the community; and		X		X	X

TEACHER RESOURCE GUIDE

TEKS Grade 3	Description	Unit No. 1	Unit No. 2	Unit No. 3	Unit No. 4	Unit No. 5
§113.5. Social Studies, GRADE 3 (continued)						
15	Science, technology, and society. The student understands how individuals have created or invented new technology and affected life in communities around the world, past and present. The student is expected to: (B) identify the impact of new technology in photography, farm equipment, pasteurization and medical vaccines on communities around the world.			X	X	X
16	Social studies skills. The student applies critical-thinking skills to organize and use information acquired from a variety of sources including electronic technology. The student is expected to: (A) obtain information, including historical and geographic data about the community, using a variety of print, oral, visual and computer sources; (B) sequence and categorize information; (C) interpret oral, visual and print material by identifying the main idea, identifying cause and effect and comparing and contrasting;				X	X
17	Social studies skills. The student communicates effectively in written, oral and visual forms. The student is expected to: (A) express ideas orally based on knowledge and experiences; (B) create written and visual material such as stories, poems, pictures, maps and graphic organizers to express ideas; and		X		X	X
18	Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others, in a variety of settings. The student is expected to: (A) use a problem-solving process to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution and evaluate its effectiveness; and (B) use a decision-making process to identify a situation that requires a decision, gather information, identify options, predict consequences and take action to implement a decision.		X		X	X

5.0 RESOURCES

4.1 Recommended Reading for Teachers

The Texas State Energy Conservation Office has developed a set of renewable energy fact sheets for teachers, students and the general public. They are available for free download and reproduction from www.infinitepower.org/factsheets.htm. Fact sheets that may be appropriate for primary school students include:

- Renewable Energy and Sustainability
- The Rewards of Renewable Energy
- Using Energy Wisely
- Renewable Energy for the Home

- Electricity from the Sun
- Solar and Electric Cars
- Renewable Energy Resources for Texas

4.2 Glossary for Teachers and Students

Biomass – organic matter, such as plants or garbage, which can be used as an energy source.

Conservation – a careful preservation and protection of something; planned management of a natural resource to prevent exploitation, destruction, or neglect.

Electricity – electric current used or regarded as a source of power.

Energy – the ability to do work.

Efficiency – being effective with minimum waste, expense or unnecessary effort.

Fuel – something consumed to produce energy.

Hydroelectric – electricity produced from moving water.

Kinetic Energy – energy that is produced by motion.

Non-renewable – something that has a limited supply that can not be replaced nor replenished.

Pollution – a material that is harmful to living things.

Potential Energy – stored energy.

Recycling – the act of using an item again instead of throwing it away.

Renewable Energy – forms of energy that derive and quickly replenish from the natural movements and mechanisms of the environment, such as sunshine, wind, movement of the seas and the heat of the Earth.

Solar – relating to the sun.

Sustainable – able to supply our needs today without harming future generation's needs.

Thermal – using or producing heat.

4.3 RECOMMENDED READING FOR STUDENTS (CHILDREN'S LITERATURE)

Bradley, K. (2003). *Energy Makes Things Happen*. New York, NY: HarperCollins Publishers.

Cobb, V. (1990). *Why Doesn't the Earth Fall Up? And Other Not Such Dumb Questions About Motion*. New York, NY: Lodestar Books.

Cobb, V. (1988). *Why Doesn't the Sun Burn Out? And Other Not Such Dumb Questions About Energy*. New York, NY: Lodestar Books.

Curry, D. (2001). *How Things Move*. Mankato: Yellow Umbrella Books.

Krulik, N. (1997). *The Magic School Bus Plays Ball: A Book About Forces*. New York, NY: Scholastic, Inc.

Murphey, P. (2002). *Around and Around*. New York, NY: Children's Press.

Murphey, P. (2002). *Push and Pull*. New York, NY: Children's Press.

Oxlade, C. (1994). *Science Magic with Forces*. London: Aladdin Books Ltd.

Pinna, S. (1998). *Forces and Motion*. Austin, TX: Steck-Vaughn Publishers.

Ward, A. (1992). *Forces and Energy*. New York, NY: Franklin Watts.

Gibbons, G. (1996). *Recycle!: A Handbook for Kids*. Boston, MA: Little, Brown, and Company.

Harlow, R. (2002) *Garbage and Recycling*. Boston, MA: Houghton Mifflin.

Leedy, L. (2000). *Great Trash Bash*. New York, NY: Holiday House.

Menzel, P. (1995). *Material World: A Global Family Portrait*. San Francisco, CA: Sierra Club Books.

Newton-John, O. & Hurst, B. (1993). *A Pig Tale*. New York, NY: Simon & Schuster.

Taback, S. (1999). *Joseph Had a Little Overcoat*. New York, NY: Viking Children's Books.

Brown, P. (1998). *Energy and Resources*. New York, NY: Scholastic.

Grant, P. & Haswell, A. (2000). *Air and Energy*. London: Thameside Press.

Miller, K. (2002). *What if We Run Out of Fossil Fuels?* New York, NY: Scholastic.

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4.4 INTERNET RESOURCES

Organization	Website
U.S. Department of Energy: Clean Cities	www.eere.energy.gov/cleancities/
Alliant Energy	www.alliantenergykids.com/environment
U.S. Department of Energy: Energy Information Administration	www.eia.doe.gov/kids/
Ohio State University: Wonders of Our World	wow.osu.edu/experiments.php
California Energy Commission	www.energyquest.ca.gov/
Danish Ministry of the Environment and Energy	www.windpower.org/en/kids/
U.S. Department of Energy: Fossil Energy	fossil.energy.gov/education/energylessons/index.html
Project Learning Tree	www.plt.org/
National Renewable Energy Lab	www.rne2ew.org/
Community Science Action Guides	fi.edu/guide/hughes/energychains.html
NASA	spaceplace.nasa.gov/en/kids/phonedrmarc/2002_january.shtml
Wisconsin K-12 Energy Education Program	www.uwsp.edu/cnr/wcee/keep/Mod1/Whatis/experiments.htm
National Energy Education Development Project	www.need.org/
National Science Digital Library	nsdl.org
Environmental Science Activities for the 21st Century	esa21.kennesaw.edu/activities/activities.htm
Environmental Protection Agency: Energy Star	http://www.energystar.gov
Alliance to Save Energy	www.ase.org
California Energy Commission Bright School Program	www.energy.ca.gov/efficiency/brightschoools
California Energy Commission Conservation Web Links	www.energy.ca.gov/links/conservation.html
Consumer Energy Center	Energy Efficiency at Home, Office and School (www.ConsumerEnergyCenter.org)
Energy Efficiency and Renewable Energy Network Dr. E's Energy Lab	www.eren.doe.gov/kids
Federal Consumer Information Center	www.pueblo.gsa.gov
Green Schools	www.ase.org/greenschools
PowerSmart	tips to save money and the planet - Alliance to Save Energy
Rocky Mountain Institute - for Kids	www.rmi.org
U.S. Dept of Energy Kids Zone	http://www.energy.gov/engine/
U.S. Dept. of Energy - Energy Efficiency	www.energy.gov/efficiency/