

5th Grade Science

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Elementary Science Curriculum Guide for 5th Grade

The state of Texas has identified science as a core subject area to be taught at each grade level. Students are to become proficient in the Texas standards known as the Texas Essential Knowledge and Skills (TEKS). The Brownsville Independent School District’s Elementary Science Scope and Sequence Chart is based on the TEKS. Each grade level timeline includes the introduction for the TEKS from the Texas Education Agency.

The Brownsville Independent School District has adopted the Full Option Science System (FOSS) program as the primary instructional resource to deliver science instruction in grades kindergarten through fifth grade. The FOSS program is a hands-on, inquiry-based science kit program developed by the Lawrence Hall of Science. The program is designed to deliver a high level of content and science skill to elementary children. In the chart that follows the introduction, the sequence for the FOSS program kits is listed across the top and the TEKS are listed along the left-hand side. In the columns to the left of each TEK the activity and investigation are listed. When using the FOSS program, teachers should refer to the chart to make sure that the appropriate TEK is reinforced in each investigation and activity.

Example

(Taken from Brownsville ISD “Timeline for 5th Grade”)

Introduction is from the Texas Essential Knowledge and Skills published by the Texas Education Agency.

Introduction (From the Texas Essential Knowledge and Skills)

- (1) In Grade 5, the study of science includes planning and implementing field and laboratory investigations using scientific methods, analyzing information, making informed decisions, and using tools such as nets and cameras to collect and record information. Students also use computers and information technology tools to support scientific investigations.

Objectives (TEKS)		Kit Scope and Sequence			
		Solar Energy 9 Weeks	Mixtures and Solutions 9 Weeks	Environments 9 Weeks	Models & Designs 9 Weeks
	Scientific processes. The student conducts classroom and field investigations following home and school safety procedures and environmentally appropriate and ethical practices.				
4.1	(A) demonstrate safe practices during classroom and field investigations; and	Inv. 1 - 4	Inv. 1 - 4	Inv. 1 - 4	Inv. 1 - 4

Texas Essential Knowledge and Skill (TEK)

FOSS program kit title

Six Weeks that the kit will be taught

Investigation and Part of FOSS program that teaches a TEK
(Note that in grades K- 2 the Investigations are called Activities)
In this example, it is Investigations 1 – 4 that teach TEK 5.1

Number of TEK as per TEA

Science Scope and Sequence Chart Timeline for 5th Grade

Introduction (From the Texas Essential Knowledge and Skills)

- (1) In Grade 5, the study of science includes planning and implementing field and laboratory investigations using scientific methods, analyzing information, making informed decisions, and using tools such as nets and cameras to collect and record information. Students also use computers and information technology tools to support scientific investigations.
- (2) As students learn science skills, they identify structures and functions of Earth systems including the crust, mantle, and core and the effect of weathering on landforms. Students learn that growth, erosion, and dissolving are examples of how some past events have affected present events. Students learn about magnetism, physical states of matter, and conductivity as properties that are used to classify matter. In addition, students learn that light, heat, and electricity are all forms of energy.
- (3) Students learn that adaptations can improve the survival of members of a species, and they explore an organism's niche within an ecosystem. Students continue the study of organisms by exploring a variety of traits that are inherited by offspring from their parents and study examples of learned characteristics.
- (4) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.
- (5) A system is a collection of cycles, structures, and processes that interact. Students should understand a whole in terms of its components and how these components relate to each other and to the whole. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems and can be observed and measured as patterns. These patterns help to predict what will happen next and can change over time.
- (6) Investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

Objectives (TEKS)		Kit Scope and Sequence			
		Solar Energy 9 Weeks	Mixtures and Solutions 9 Weeks	Environments 9 Weeks	Models & Designs 9 Weeks
	Scientific Processes. The student conducts field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices.				
5.1	(A) demonstrate safe practices during field and laboratory investigations; and		Inv. 1 Pt. 1	Overview Pg. 17	Inv. 1 – 3
5.1	(B) make wise choices in the use and conservation of resources and the disposal of	Inv. 1 – 3 Pt. 1 & 2 Inv. 4 Pt. 4 Pg. 26 – 27 Science Stories	Inv. 1 Pt. 1	Inv. 5 Pt. 1 – 3	

	Scientific processes. The student uses scientific methods during field and laboratory investigations.				
5.2	(A) plan and implement descriptive and simple experimental investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology.	Inv. 1 – 4	Inv. 4 Pt. 4 Inv. 1 – 4	Inv. 6 Pt. 3	Inv. 1 – 4
5.2	(B) collect information by observing and measuring;	Inv. 1 – 4	Inv. 2 Pt. 2	Inv. 5 Pt. 1 – 3 Inv. 4 Pt. 2 Inv. 1	Inv. 1 – 3
5.2	(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;	Inv. 2 Pt. 2		Inv. 2 Pt. 3 Inv. 1	Inv. 1 – 4
5.2	(D) communicate valid conclusions; and	Inv. 1 – 4	Inv. 1 – 4	Inv. 1 – 3	
5.2	(E) construct simple graphs, tables, maps, and charts using tools including computers to organize, examine, and evaluate information.	Inv. 1 – 4	Inv. 2 Math Extension	Inv. 5 Pt. 1 & 2	Inv. 1 - 4
	Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions.				
5.3	(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;	Inv. 3 Science Stories 22 – 24	Inv. 2 Pt. 1 & 2	Inv. 5 Pt. 1 & 2	Inv. 1 – 4
5.3	(B) draw inferences based on information related to promotional materials for products and services;	Inv. 3 Science Stories			Inv. 1 Pt. 1 – 3 Inv. 2 Pt. 1 & 2 Inv. 3 Pt. 1 – 3 Inv. 4 Pt. 1
5.3	(C) represent the natural world using models and identify their limitations;				Inv. 1 Pt. 1
5.3	(D) evaluate the impact of research on scientific thought, society, and the environment; and			Inv. 5 Pt. 1 – 3	Inv. 1 Pt. 1 – 3 Inv. 2 Pt. 1 & 2 Inv. 3 Pt. 1 & 2 Inv. 4 Pt. 1

5.3	(E) connect Grade 5 science concepts with the history of science and contributions of scientists.	Science Stories Pg. 25 Inv. 3 Pt. 2	Science Stories Pg. 7 – 10, 11 – 13 26 – 33		Inv. 1 – 4 Pgs. 1 – 27 Science Stories
	Scientific processes. The student knows how to use a variety of tools and methods to conduct science inquiry.				
5.4	(A) collect analyze information using tools including calculators, microscopes, cameras, sound recorders, computers, hand lenses, rulers, thermometers, compasses, balances, hot plates, meter sticks, timing devices, magnets, collecting nets, and safety goggles; and	Inv. 1 Pt. 2 Inv. 2 Pt. 2 Inv. 3 – 4	Inv. 3 Inv. 1 Pt. 2 & 3 Inv. 2 Math Extensions Inv. 4 Pt. 1	Inv. 4 Pt. 1	Inv. 1 Pt. 1 – 3 Inv. 4 Pt. 2 Science Extensions
5.4	(B) describe some interactions that occur in simple system.	Science Stories			Inv. 3 Pt. 1 & 2 Inv.3 Pt. 1 & 2 Inv. 4 Pt. 2 & 3
	Science concepts. The student knows that some change occurs in cycles.				
5.6	(A) identify events and describe changes that occur on a regular basis such as in daily, weekly, lunar, and seasonal cycles;	Inv. 1 Pt.2 Pg. 3 Inv. 3 Pt. 2			
5.6	(B) identify the significance of the water, carbon, and nitrogen cycles; and	Science Stories		Inv 1- 6	
5.6	(C) describe and compare life cycles of plants and animals.			Inv. 1 – 6	
	Science concepts. The student knows that matter has physical properties.				
5.7	(A) classify matter based on its physical properties including magnetism, physical state, and the ability to conduct or insulate heat, electricity, and sound;	Inv. 1 Pt. 2 Inv. 3 Pt. 1	Inv. 1 Pt. 1 & 2 Pgs. 12 – 19 Inv. 1 Pt. 1 – 3	Inv. 2 Pt. 1 www.foss.web.com	Inv.2 Pt. 2 & 3
5.7	(B) demonstrate that some mixtures maintain the physical properties of their ingredients;		Inv. 1-4		
5.7	(C) identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving sugar in water; and		Inv. 1 Pt. 2 & 3 Inv. 2 Pt. 1 & 2		

5.7	(D) observe and measure characteristic properties of substances that remain constant such as boiling points and melting points.		Inv. 3-4		
	Science concepts. The student knows that energy occur in many forms.				
5.8	(A) differentiate among forms of energy including light, heat, electrical, and solar energy;	Student sheet's # 27 – 28 Inv. 1 Pt. 1 Inv. 4 Pt. 1 Science Stories Pgs. 1 – 7			Inv. 2
5.8	(B) identify and demonstrate everyday examples of how light is reflected, such as from tinted windows, and refracted, such as in cameras, telescopes, and eyeglasses;	Inv. 3 Pt. 1 Inv. 4 Pt. 1 Student Sheet's # 28			
5.8	(C) demonstrate that electricity can flow in a circuit and can produce heat, electrical, and solar energy; and				Inv. 2 Pt. 1 & 2
5.8	(D) verify that vibrating an object can produce sound.				Inv. 2 Pt. 1 Inv. 4 Pt. 2
	Science concepts. The student knows that adaptations may increase the survival of members of a species.				
5.9	(A) compare the adaptive characteristics of species that improve their ability to survive and reproduce in an ecosystem;			Inv.5 Pt 1 – 3	
5.9	(B) analyze and describe adaptive characteristics that result in an organism's unique niche in an ecosystem; and			Inv. 5 Pt. 1 – 3	
5.9	(C) predict some adaptive characteristics required for survival and reproduction by an organism in an ecosystem.			Science Stories Pg. 5	
	Science concepts. The students know that likenesses between offspring and parents can be inherited or learned.				

5.10	(A) identify traits that are inherited from parent to offspring in plants and animals; and			Science Stories	
5.10	(B) give examples of learned characteristics that result from the influence of the environment.			Inv. 2 Pt. 1 – 3 Science Stories Inv. 4 Pt. 3	
	Science concepts. The students know that certain past events affect present and future events.				
5.11	(A) identify and observe actions that require time for changes to be measurable, including growth, erosion, dissolving, weathering, and flow;	Inv. 3 & 4	Inv. 2 Pt. 1		
5.11	(B) draw conclusions about “what happened before” using data such as from tree-growth rings and sedimentary rock sequences; and	Science Stories Inv. 1 Pt. 1			
5.11	(C) identify past events that led to the formation of the Earth’s renewable, nonrenewable, and inexhaustible resources.	Science Stories			
	Science concepts. The student knows that the natural world includes earth materials and objects in the sky.				
5.12	(A) interpret how land forms are the result of a combination of constructive and destructive forces such as deposition of sediment and weathering;	Inv. 2 & 3			
5.12	(B) describe processes responsible for the formation of coal, oil, gas and minerals;	Science Stories Inv. 1 Pt. 1			
5.12	(C) identify the physical characteristics of the Earth and compare them to the physical characteristics of the moon; and	Science Stories NASA, GEMS			
5.12	(D) identify gravity as the force that keeps planets in orbit around the sun and the moon in orbit around the Earth.	Science Stories NASA, GEMS Inv. 1 Pt. 1 www.fossweb.com			

Appendices

ESL Learning Strategies for Science

Metacognitive Strategies:

Advance Organization

Students plan, monitor, and evaluate their learning of science concepts and skills.

What's my purpose for solving this problem or doing this experiment? What is the question? What will I use the information for?

Selective Attention

What is the most important information to pay attention to?

Organizational Planning

What are the steps of the scientific method I will need to follow?

Self-monitoring

Does the plan seem to be working? Am I getting the answer?

Self-assessment

Did I solve the problem/answer the question? How did I solve it? Is it a good solution? If not, what could I do differently?

Cognitive Strategies:

Elaborating Prior Knowledge

Students interact with the information to be learned, changing or organizing it either mentally or physically.

What do I already know about this topic or type of problem? What experiences have I had that are related to this? How does this information relate to other information?

Taking Notes

What's the best way to write down a plan to solve the problem? Table? Chart? List? Diagram?

Grouping

How can I classify this information? What is the same and what is different?

Making Inferences

Are there words I don't know that I must understand to solve the problem?

Using Images

What can I draw to help me understand and solve the problem? Can I make a mental picture or visualize this problem?

Social/Affective Strategies:

Students interact with others to assist learning, or use attitudes and feelings to help their learning.

Questioning for Clarification

What help do I need? Who can I ask? How should I ask?

Cooperating

How can I work with others to answer the question or solve the problem?

Safety Guidelines for the Brownsville Independent School District Elementary Science Program

5th Grade

- Always follow the safety procedures outlined by your teacher.
- Never put any materials in your mouth. Do not taste any chemicals unless your teacher specifically tells you to. Investigate with your other senses (touch, smell, sight, hearing).
- Do not smell any unknown material. If your teacher asks you to smell a material, wave a hand over the material to draw the scent toward your nose.
- Do not touch your face, mouth, ears, or eyes while working with chemicals, plants, or animals. There might be something on your hands that should not get in your eyes.
- Do not mix unknown chemicals just to see what might happen.
- Always wash your hands immediately after using chemicals.
- If something gets spilled or broken, tell your teacher. Do not clean up broken or spilled things unless your teacher tells you it is okay.
- Clean up your work space after each investigation.
- Be careful when using sharp or pointed tools. Always make sure that you protect your eyes and those of your neighbors.
- Report all accidents, even small ones, to your teacher.
- Follow directions and ask questions if you're unsure of what to do.
- Behave responsibly during science investigations.

Solar Energy

- Do not look directly at the sun. It can permanently damage your eyes.

Mixtures and Solutions

- Keep your work area as neat as you can, and clean up spills quickly.
- Do not put the seeds, powders, or liquids used in this unit in your mouth.

Environments

- If you think you have allergies, tell your teacher.
- Try not to stir up dust when you prepare terrariums.

Models and Designs

- Do not ever try the activities in this unit with electricity from wall sockets. Use only batteries.
- Be careful when you build the vehicles. Small parts can pop off and fly through the air.

Safety rules adapted from
Full Option Science System
(FOSS) Modules