FBISD
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TEACHING & LEARNING

Department of Teaching & Learning

5th Grade Science
Overview
2024 - 2025

This document is designed to provide parents/guardians/community an overview of the curriculum taught in the FBISD classroom. This document supports families in understanding the learning goals for the course, and how students will demonstrate what they know and are able to do. The overview offers suggestions or possibilities to reinforce learning at home.

Included at the end of this document, you will find:

- A glossary of curriculum components
- The content area instructional model
- Parent resources for this content area

To advance to a particular grading period, click on a link below.

The standards below describe ways in which students are expected to engage with the content. The Scientific and Engineering Practices (SEPs) describe practices that students need to do in the classroom in order to learn the content. The Recurring Themes and Concepts (RTCs) describe how students need to think about the content in order to learn it.

Scientific and Engineering Practices (SEPs) TEKS:

5.1A Ask questions and define problems based on observations or information from text, phenomena, models, or investigations.
5.1B Use scientific practices to plan and conduct descriptive and simple experimental investigations and use engineering practices to design solutions to problems.
5.1C Demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency-approved safety standards.
5.1D Use tools, including calculators, microscopes, hand lenses, metric rulers, Celsius thermometers, prisms, concave and convex lenses, laser pointers, mirrors, digital scales, balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, notebooks, timing devices, materials for building circuits, materials to support observations of habitats or organisms such as terrariums and aquariums, and materials to support digital data collection such as computers, tablets, and cameras to observe, measure, test, and analyze information.
5.1E Collect observations and measurements as evidence.
5.1F Construct appropriate graphic organizers to collect data, including tables, bar graphs, line graphs, tree maps, concept maps, Venn diagrams, flow charts or sequence maps, and input-output tables that show cause and effect.
5.1G Develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.
5.2A Identify basic advantages and limitations of models such as their size, properties, and materials.
5.2B Analyze data by identifying any significant features, patterns, or sources of error.
5.2C Use mathematical calculations to compare patterns and relationships.
5.2D Evaluate experimental and engineering designs.
5.3A Develop explanations and propose solutions supported by data and models.
5.3B Communicate explanations and solutions individually and collaboratively in a variety of settings and formats.
5.3C Listen actively to others' explanations to identify relevant evidence and engage respectfully in scientific discussion.
5.4A Explain how scientific discoveries and innovative solutions to problems impact science and society.
5.4B Research and explore resources such as museums, libraries, professional organizations, private companies, online platforms, and mentors employed in a science, technology, engineering, and mathematics (STEM) field to investigate STEM careers.

Recurring Themes and Concepts (RTCs) TEKS:
5.5A Identify and use patterns to explain scientific phenomena or to design solutions.
5.5B Identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.
5.5C Use scale, proportion, and quantity to describe, compare, or model different systems.
5.5D Examine and model the parts of a system and their interdependence in the function of the system.
5.5E Investigate how energy flows and matter cycles through systems and how matter is conserved.
5.5F Explain the relationship between the structure and function of objects, organisms, and systems.
5.5G Explain how factors or conditions impact stability and change in objects, organisms, and systems.

Grading Period 1

Unit 1: Matter and Energy

Estimated Date Range: 8/8/24 – 9/16/24
Estimated Time Frame: 27 Days

Unit Overview:
In this unit, students will begin their science learning by engaging in discussions about safety in science and the scientific and engineering practices that scientists and engineers use when conducting investigations or designing solutions to problems. The unit focuses on the study of observable, measurable, and testable physical properties of matter and how they are used to identify, describe, classify, compare, and contrast matter. Students will investigate matter by expanding their understanding of the physical properties learned in Grade 4 (color, shape, texture, material matter is made of, physical state, temperature, mass, size, flexibility, magnetism, and relative density) to include solubility and the ability to conduct or insulate both thermal and electrical energy. Furthermore, students will observe the combination of substances to make mixtures (including solutions) and develop an understanding of conservation of matter. These concepts lead to the understanding of elements and compounds in sixth grade. Students will build on this understanding in middle school when they learn to determine density and to identify evidence of chemical changes.

At home connections:
- Discuss ways that students can be safe during science time. Emphasize the points discussed in the Science Safety Contract your child's teacher will send home. Discuss the importance of following the safety rules and wearing safety equipment.
- Use objects from home to compare and contrast matter according to physical properties of matter. The physical properties include observable properties such as color, shape, texture, and state of matter; measurable properties such as mass, volume, and temperature; and testable properties such as magnetism, relative density, ability to conduct electrical and thermal energy, and solubility.
- Conduct investigations at home about mixtures by using common objects and substances from home. Help your child understand that solutions are types of mixtures. In a mixture that is not a solution, the physical properties of the ingredients do not change after the ingredients have been combined. In mixtures that are solutions, the physical properties of the ingredients change after they have been combined.

Concepts within Unit #1 **Link to TEKS**	**Success Criteria for this Concept** *Students can…*
Concept #1: Launching Scientific Mindsets 5.1B, 5.1C	• Identify safe practices that must be followed when conducting classroom and field investigations. • Describe the use of safety equipment to keep everyone safe. • Describe the Scientific and Engineering Practices that they will use to conduct investigations and design solutions to problems. • Describe how scientists' work and engineers' work are different from each other. • Describe common mindsets that they will use to conduct investigations and design solutions to problems. • Set up their interactive notebook.

Concept #2: Physical Properties 5.6A, 5.6D	• Make observations to compare and contrast matter based on observable physical properties: Color, shape, texture, material matter is made of, and physical state (solids, liquids, gases) • Construct models to illustrate how matter is made of particles that are too small to be seen. • Explain how matter can be detected even if it cannot be seen. • Measure or use measurements to compare and contrast matter based on measurable physical properties: Temperature, mass, size, and volume. • Conduct investigations to compare and contrast matter based on testable physical properties: Flexibility, magnetism, relative density, solubility, ability to conduct and insulate thermal energy, and ability to conduct and insulate electrical energy.
Concept #3: Mixtures 5.6B, 5.6C, 5.6D	• Use observations and measurements to compare changes (or lack of) that occur in the physical properties of substances before and after they are combined. • Explain whether the resulting product of combining two or more substances is a mixture or a mixture that is a solution. • Construct models that illustrate how matter in solutions is made of particles that are too small to be seen. • Explain how matter is conserved in mixtures, including solutions.

Unit 2: Force and Motion

Estimated Date Range: 9/17/24 – 10/09/24
Estimated Time Frame: 15 Days

Unit Overview:
In this unit, students will investigate equal and unequal forces and the effects these forces have on objects (motion and direction). In order to investigate forces and their interactions with objects, students will be expected to plan and conduct simple experimental investigation that test the effect of forces on objects that are in a system. Experimental investigations involve a process in which a "fair test" is designed, and variables are actively manipulated, controlled, and measured in an effort to gather evidence to support or refute a causal relationship. In 5th grade, "simple" experimental investigation refers to the fact that students will be seeking to establish a cause-and-effect relationship with only one variable. Students will build on this understanding in middle school when they begin to use calculations and measurements to study force, motion, and energy through the study of Newton's Laws of Motion.

At home connections:
- When studying forces, students are learning about the effects of friction, gravity, and magnetism. Help your child design an investigation that can test the effects of those forces on objects by using ramps and surfaces of different textures.
- Conduct simple experimental investigation with your child at home following Scientific and Engineering Practices studied in class. Help your child select a good topic to conduct an investigation about. Guide your child to create a good question, formulate a hypothesis, identify variables, perform multiple trials, collect and record data, and write conclusions that include a claim, evidence, and reasoning. For ideas about possible investigations to conduct, click here.

Concepts within Unit #2 **Link to TEKS**	**Success Criteria for this Concept** *Students can…*
Concept #1: Equal and Unequal Forces 5.7A	• Develop explanations for how equal and unequal forces affect the patterns of an object's motion, including its speed and direction. • Develop explanations for how energy transfers as part of the interactions between forces and objects. • Construct an argument with evidence that supports a claim about how equal and unequal forces affect the patterns of an object's motion, including its speed and direction.

Concept #2: Effects of Forces
5.7B
	• Plan and conduct experimental investigations:
	  ○ Ask questions to conduct experimental investigations that show a cause-and-effect relationship between forces and an object's motion.
	  ○ Identify variables in order to plan and conduct experimental investigations that show a cause-and-effect relationship between forces and an object's motion.
	  ○ Formulate a hypothesis that show a cause-and-effect relationship between forces and an object's motion.
	  ○ Collect observations and measurements as evidence by conducting fair tests to increase reliability of the results.
	  ○ Construct appropriate data tables and charts to show a cause-and-effect relationship between forces and an object's motion.
	• Develop models to represent how equal and unequal forces interact with objects.
	• Develop explanations for how equal and unequal forces affect the patterns of an object's motion, including its speed and direction.
	• Develop explanations for how energy transfers as part of the interactions between forces and objects.
	• Construct an argument with evidence that supports a claim about how equal and unequal forces affect the patterns of an object's motion, including its speed and direction.
	• Determine the question, materials, variables, and procedures to test the effect of forces on objects when given a partial description of an investigation.

Grading Period 2

Unit 2: Force, Motion, and Energy (Continued)

Estimated Date Range: 10/16/24 – 10/17/24
Estimated Time Frame: 2 Days

Unit 3: Energy

Estimated Date Range: 10/18/24 – 11/22/24
Estimated Time Frame: 24 Days

Unit Overview:
In this unit, students will continue to build their understanding about energy by investigating energy and the different ways it is perceived and transformed, which include mechanical, light, thermal, electrical, chemical, and sound. They will uncover cycles (e.g., movement of thermal energy), patterns (e.g., behavior of light, including reflection and refraction), and systems through their explorations. Students will build on this understanding in middle school when they begin to use calculations and measurements to study force, motion, and energy through the study of Newton's Laws of Motion.

At home connections:

- Discuss how energy changes or transform in systems. Provide examples about the type of energy used and produced by different household objects such as TV, computer, lamp, microwave, etc.
- Help your child create virtual circuits here. Engage in discussions about what makes the circuit work.
- Investigate how light reacts when it strikes objects such as mirrors and lenses. Have students draw how light bounces off mirrors (reflection) and bends when it goes through transparent materials such as lenses (refraction).

Concepts within Unit #3 **Link to TEKS**	**Success Criteria for this Concept** *Students can…*
Concept #1: Energy Transformation 5.8A	• Collect and use evidence to describe the transformation of energy in systems. • Design, test, and refine a device that transforms energy from one form to another.
Concept #2: Electrical Energy in Circuits 5.8B	• Collect and use evidence to describe that electrical energy can be transformed into motion, light sound, and thermal energy in electrical circuits with switches, and one or multiple paths of electricity. • Analyze circuit models and diagrams to identify the requirements for a functional electrical circuit with switches, and one or multiple paths of electricity.
Concept #3: Light 5.8C	• Use models to explain that light travels in a straight line. • Analyze data to identify patterns that show that light can be reflected, refracted, or absorbed. • Analyze models to explain how light travels and behaves when it strikes objects.

Unit 4: Patterns in the Natural World

Estimated Date Range: 12/2/24 – 12/20/24
Estimated Time Frame: 15 Days

Unit Overview:
In this unit, students will continue to build on their understanding of the Sun, Earth, and Moon system studied in 3rd grade, concentrating their learning on identifying recognizable patterns and processes as they learn about Earth's rotation and demonstrate the effects this movement has on Earth's surface, including day and night, shadows, and the rotation of Earth on its axis. Students will build on this understanding in middle school when they learn how the tilted Earth revolves around the Sun, causing changes in seasons, and how the positions of the Earth, Sun, and Moon cause daily, spring, and neap cycles of ocean tides due to gravitational forces.

At home connections:

- Help your child track the apparent movement of the Sun in the sky by constructing a sun dial. Discuss how the Earth's rotation is responsible for the day/night cycle and the apparent movement of the Sun in the sky.
- Observe the shadows created by the Sun dial. Encourage your child to make conclusions based on the length and direction of the shadows according to the position of the Sun in the sky.

Concepts within Unit #4 **Link to TEKS**	**Success Criteria for this Concept** *Students can…*
Concept #1: Day and Night 5.9	• Use models to demonstrate how Earth rotates, including: Type of Motion, direction of movement, direction of axis, and length of time it takes. • Analyze models to reveal patterns of daily changes related to day and night. • Explain how Earth's rotation is related to the day/night cycle.
Concept #2: Shadows 5.9	• Use models to demonstrate how the Sun appears to change position across the sky. • Analyze data to reveal patterns of daily changes in the apparent position of the Sun across the sky, including the shape (length) and direction of shadows. • Explain how Earth's rotation is related to the apparent movement of the Sun in the sky, including the shape (length) and direction of shadows.

Grading Period 3

Unit 5: Processes and Patterns on Earth

Estimated Date Range: 1/09/25 – 2/07/25
Estimated Time Frame: 21 Days

Unit Overview:
In this unit, students will deepen their understanding about the water cycle by determining the role that the sun and the oceans play in it. Students are expected to build a model to identify the sun and the ocean's roles in weather. In addition, students will learn how wind, water, and ice cause changes to Earth's surface through the processes of weathering, erosion, and deposition, and how these processes create landforms such as canyons, deltas and sand dunes. In 4th grade, students identified how the processes of weathering, erosion, and deposition cause slow changes to Earth's surface. In 5th grade, this concept becomes more specific as students are required to identify landforms and the specific processes that led to their changes overtime. Students will also explore the processes that led to the formation of sedimentary rock and fossil fuels. In 5th grade, students are expected to sequence these events and describe the processes involve in every step of the formation of sedimentary rocks and fossil fuels.

At home connections:

- Discuss the role that the sun and ocean play in the water cycle by constructing a simple model that represents the water cycle. For example, set up water in a container outside and inside. Measure the amount of water evaporated. Discuss the role of the sun in the evaporation process. Discuss what the water in the container represented.
- With parental supervision, students can go outside and find evidence of weathering, erosion, and deposition on the ground. Students can create illustrations that describe the processes of weathering, erosion, and deposition and explain how those processes change the Earth's surface.
- Using Google Earth, help your child locate different landforms in the state or country such the Guadalupe Peak in Texas or the Grand Canyon in Arizona. Discuss with students how the landforms have changed overtime due to the actions of weathering, erosion, and deposition.
- Guide students to create a paragraph, a graphic organizer, or comic book that sequences the processes that led to the formation of sedimentary rocks and fossil fuels.

Concepts within Unit #5 Link to TEKS	**Success Criteria for this concept** *Students can…*
Concept #1: The Water Cycle and Weather 5.10A	• Explain the role that the sun and the oceans play in the water cycle and how they interact with each other to impact weather.
Concept #2: Formation of Sedimentary Rocks and Fossil Fuels 5.10B	• Recognize and explains how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface caused by weathering, erosion, and deposition using models and diagrams. • Identify agents (water, wind, and/or ice) that caused slow changes to Earth's surface.
Concept #3: Formation of Landforms 5.10C	• Explain the processes that led to the formation of sedimentary rocks. • Explain the processes that led to the formation of fossil fuels.

Unit 6: Natural Resources and their Management

Estimated Date Range: 2/10/25 – 2/20/25
Estimated Time Frame: 7 Days

Unit Overview:
In this unit, students in 5th grade will study how to use the ideas of conservation, recycling, and proper disposal to reduce the impact the use of natural resources has on the environment. Students will work on a project to design possible actionable solutions to problems that affect their communities related to use of natural resources by using the Engineering Design Process (EDP) to approach their solutions.

At home connections:

- Discuss what changes can be made to our daily life habits to ensure we conserve natural resources.

- Help your child identify possible problems in the community related to reducing the environmental impact of the use of natural resources.

Concepts within Unit #6 Link to TEKS	Success Criteria for this concept *Students can…*
Concept #1: Management of Natural Resources 5.11	• Design a solution that minimizes environmental impact of the use of natural resources. • Evaluate their solutions to reduce the environmental impact of the use of natural resources.

Unit 7: Interactions within Environments

Estimated Date Range: 2/21/25 – 3/07/25
Estimated Time Frame: 10 Days

Unit Overview:
In this unit, students will explore the relationships, systems, and cycles within environments. Students will review the characteristics of different environments studied in previous grade levels and determine how organisms interact with living and non-living things in order to survive. Students will also trace the flow of energy between organisms in a food web and infer how changes in one population may affect another. This units continues in grading period 4.

At home connections:

- Engage your child in observations of nature by visiting a place such as a garden, a yard, a park, etc. Help you child make connections to understand how animals and plants depend on each other to survive. Help your child see that animals and plants depend on each other for food or shelter. They also depend on the environment to provide sunlight, air, and water.
- When observing animals and plants, prompt your child to identify the organisms observed as a producer (makes its own food), consumer (depends on other organisms for food), and decomposer (breaks down organic matter).
- Encourage your child to think about the food chains and food webs that can be formed with the animals and plants that live in the environment you are observing. Review that the flow of energy in a diagram of the food chain or food web is always pointing at the organism receiving the energy.

Concepts within Unit #7 Link to TEKS	Success Criteria for this Concept *Students can…*
Concept #1: Biotic and Abiotic Interactions 5.12A	• Explain ways that organisms live and survive in their ecosystems by interacting with the biotic (living) and abiotic (nonliving) components.
Concept #2: Effects of Changes in Ecosystems 5.12B	• Describe the flow of energy within food chains and food webs. • Explains the role of the sun, producers, consumers, and decomposers in a food chain and food web.

Grading Period 4

Unit 7: Interactions within Environments (Continued)

Estimated Date Range: 2/17/25 – 3/25/25
Estimated Time Frame: 7 Days

Unit Overview:
In this portion of Unit 7, students will describe how changes to ecosystems affect the organisms within the system. Students will predict the possible effects on ecosystems that can be caused by natural disasters, changes to the Earth over time, human interaction, and the actions of other organisms.

At home connections:

- Discuss with your child the effects that a change in the environment such as a wildfire, drought, or human interactions could have on the organisms that live there. Point out that these changes could affect the food chains and food webs of the organisms.

Concepts within Unit #7 Link to TEKS	**Success Criteria for this Concept** *Students can…*
Concept #3: Human Impact on Ecosystems 5.12C	• Predict the effects of changes in ecosystems caused by living organisms.

Unit 8: Structures and Growth of Organisms

Estimated Date Range: 3/26/25 – 4/29/25
Estimated Time Frame: 22 Days

Unit Overview:
In this unit, students will learn in about the various types of structures (body parts) and functions (what those body parts do) of plants and animals that enable them to survive in their specific ecosystem. Students will learn that some behaviors are inherited; therefore, they are passed on from parents to offspring. Students will also learn that some organisms exhibit behaviors that are learned during the organisms' lifetime. In 5th grade, students to be able to differentiate examples of inherited behaviors (instincts) and learned behaviors.

At home connections:

- Students need to be able to compare the structures (parts of the body) and functions (what the body parts do) of different animals and plants. With adult supervision, encourage your child to find pictures of different birds. Examine the structures of the birds such as their beak, feathers, feet, etc. Compare the different structures and what they do (function). Repeat this with animals such a fish and mammals.
- Play a game with your child to distinguish between inherited traits (features that are pass on from parents to offspring such as hair color, eye color, and animal fur) and learned behaviors (behaviors that organisms exhibit after learning them such a dog playing fetch or humans reading and writing). During the game, each participant has to list the most inherited traits they can think of. Then, participants will list all the learned behaviors they can think of. The winner is the participant with the most correct answers.

Concepts within Unit #8 Link to TEKS	**Success Criteria for this Concept** *Students can…*
Concept #1: Structures and Functions of Organisms 5.13A	• Analyze structures and functions of different species that help them live and survive in a specific environment.
Concept #2: Behavioral Traits of Organisms 5.13B	• Differentiate between instinctual behaviors and learned behaviors of organisms.

Unit 9: Making Connections

Estimated Date Range: 4/30/25 – 5/29/25
Estimated Time Frame: 21 Days

Unit Overview:
In this unit, students will explore the engineering process to solve real-world problems. Students will have opportunities to follow the engineering design cycle to analyze a problem, brainstorm solutions, design a product, test, and re-design a product to find the best solution.

At home connections:

- STEM activities require problem solving skills and critical thinking to be solved. Engage with your child in solving some of these challenges together to apply the science concepts learned throughout the year. For ideas on STEM activities, click here.

Concepts within Unit #9 **Link to TEKS**	**Success Criteria for this Concept** *Students can…*
Concept #1: Student Projects 5.1A, 5.1B, 5.1c, 5.1D, 5.1E, 5.1F, 5.1G, 5.2A, 5.2B, 5.2C, 5.2D, 5.3A, 5.3B, 5.3C, 5.4A, 5.4B	• Use critical thinking and scientific problem solving to make informed decisions. • Analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning, and experimental and observational testing.

Glossary of Curriculum Components

Overview– The content in this document provides an overview of the pacing and concepts covered in a subject for the year.
TEKS – Texas Essential Knowledge and Skills (TEKS) are the state standards for what students should know and be able to do.
Unit Overview – The unit overview provides a brief description of the concepts covered in each unit.
Concept – A subtopic of the main topic of the unit.
Success Criteria—a description of what it looks like to be successful in this concept.
Competency—Standards-Based Grading communicates students' understanding of the Texas Essentials Knowledge and Skills (TEKS). Using the TEKS, teachers developed grade-level competencies to communicate student progress in the Standards-Based gradebook. The competencies are the same for each grade-level content area (i.e. 1st grade math) across the district. Teachers report students' progress on the competencies using learning progressions.

Parent Resources

The following resources provide parents with ideas to support students' understanding. For sites that are password protected, your child will receive log-in information through their campus.

Resource	How it supports parents and students
EduSmart	This resource provides hand-on and vocabulary activities that are great to review the concepts learned in the classroom. Students sign in through their school account in Clever.
Pebble Go	This resource provides access to books for reading and learning more about concepts in the science content.
Britannica School	This is an information resource for elementary students. It has encyclopedia articles, multimedia, primary sources, games, and other learning resources that support student learning.
Ebsco Host	This online reference system serves all content areas.
World Book	World Book contains thousands of informational articles with stunning illustrations, videos, interactive maps, and activities.
National Geographic Kids	This resource is a fact-filled, fast-paced magazine created especially for ages 6 and up. It has an award-winning combination of photos, facts, and fun.

Instructional Model

An instructional model is the structure in which students engage in a particular content that ensures understanding of that content. In science, the instructional model is the 5E Instructional Model.

The 5E Model is an inquiry-based approach to teaching and learning science concepts over time. It is research-based and emphasizes that children build conceptual understanding and make meaning through experiences. Each "E" represents a stage in a learning cycle.

- Engage: Students interact with a phenomenon that sparks curiosity and assesses prerequisite knowledge or misconceptions.
- Explore: Students begin to interact with the content through hands-on investigations.
- Explain: Students connect the hands-on experience to the instruction of the concept using grade level appropriate academic vocabulary.
- Elaborate: Students apply the concept learned to a new context through problem solving or an additional hands-on experience.
- Evaluate: Evaluation of student understanding and progress occurs throughout the learning cycle.

As students learn each concept in the curriculum, they will have the opportunity to develop conceptual understanding as the teacher navigate the content as telling a story. The graphic below summarizes each component that occurs within each of the 5E stages.