

## 4<sup>th</sup> 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.

- [Grading Period 1](#)
- [Grading Period 2](#)
- [Grading Period 3](#)
- [Grading Period 4](#)

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:

- 4.1A Ask questions and define problems based on observations or information from text, phenomena, models, or investigations.
- 4.1B Use scientific practices to plan and conduct descriptive investigations and use engineering practices to design solutions to problems.
- 4.1C Demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency-approved safety standards.
- 4.1D Use tools, including hand lenses; metric rulers; Celsius thermometers; calculators; laser pointers; mirrors; digital scales; balances; graduated cylinders; beakers; hot plates; meter sticks; magnets; notebooks; timing devices; sieves; materials for building circuits; materials to support observation of habitats of organisms such as terrariums, aquariums, and collecting nets; and materials to support digital data collection such as computers, tablets, and cameras, to observe, measure, test, and analyze information.
- 4.1E Collect observations and measurements as evidence.
- 4.1F 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.
- 4.1G Develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.
- 4.2A Identify basic advantages and limitations of models such as their size, properties, and materials.
- 4.2B Analyze data by identifying any significant features, patterns, or sources of error.
- 4.2C Use mathematical calculations to compare patterns and relationships.
- 4.2D Evaluate a design or object using criteria.
- 4.3A Develop explanations and propose solutions supported by data and models.
- 4.3B Communicate explanations and solutions individually and collaboratively in a variety of settings and formats.
- 4.3C Listen actively to others' explanations to identify relevant evidence and engage respectfully in scientific discussion.
- 4.4A Explain how scientific discoveries and innovative solutions to problems impact science and society.
- 4.4B 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:**

- 4.5A Identify and use patterns to explain scientific phenomena or to design solutions.
- 4.5B Identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.
- 4.5C Use scale, proportion, and quantity to describe, compare, or model different systems.
- 4.5D Examine and model the parts of a system and their interdependence in the function of the system.
- 4.5E Investigate how energy flows and matter cycles through systems and how matter is conserved.
- 4.5F Explain the relationship between the structure and function of objects, organisms, and systems.
- 4.5G Explain how factors or conditions impact stability and change in objects, organisms, and systems.

**Grading Period 1**

**Unit 1: Matter**

Estimated Date Range: 8/8/24 – 9/13/24

Estimated Time Frame: 26 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, and classify matter. Students will investigate matter by expanding their understanding of the physical properties learned in Grade 3 (color, shape, texture, material matter is made of, physical state, temperature, mass, size, flexibility, and magnetism) to include the physical property of relative density in water. Furthermore, students will compare and contrast a variety of mixtures, including solutions, and demonstrate that matter is conserved in mixtures when some solids have been combined with water. These concepts lead to the understanding of the physical properties of volume, solubility, and ability to conduct and insulate thermal and electrical energy that are studied in Grade 5 along with the idea of conservation of matter in solutions.

**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 classify 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 and temperature; and testable properties such as magnetism and relative density.
- 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  
4.1B, 4.1C

- 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 4.6A	<ul style="list-style-type: none"> <li>• Make or uses observations to describe and classify matter based on observable physical properties: Color, shape, texture, Material matter is made of, and physical state (Solids, Liquids, Gases)</li> <li>• Measure or use measurements to describe and classify matter based on measurable physical properties: Temperature, mass, and size (length)</li> <li>• Conduct investigations or uses data to describe and classify matter based on testable physical properties: Flexibility, magnetism, relative density.</li> </ul>
Concept #3: Mixtures 4.6B, 4.6C	<ul style="list-style-type: none"> <li>• Use observations and measurements to compare and contrast mixtures, including solutions by describing the physical properties of their substances.</li> <li>• Explain how matter is conserved in mixtures.</li> </ul>
<p align="center"><b>Unit 2: Force and Motion</b> Estimated Date Range: 9/16/24 – 10/09/24 Estimated Time Frame: 16 Days</p>	
<p><b>Unit Overview:</b> In this unit, students will investigate forces, including friction, gravity, and magnetism to identify them as either contact forces or forces that act a distance and to observe their effects on objects. When studying the effects these forces have on objects, students will be expected to identify patterns these forces cause in an object's motion. In order to investigate the forces of friction, gravity, and magnetism and their effects on objects, students are expected to plan and conduct descriptive investigations. This type of investigation involves students in collecting data to draw conclusions about phenomena without formulating a hypothesis or identifying variables. Students will build on this understanding in 5th grade when they investigate how equal and unequal forces affect an object's motion and direction.</p> <p><b>At home connections:</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Conduct simple investigations 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, perform multiple trials when collecting data, record data, and write conclusions that include a claim, evidence, and reasoning. For ideas about possible investigations to conduct, click <a href="#">here</a>.</li> </ul>	
Concepts within Unit #2 <a href="#">Link to TEKS</a>	Success Criteria for this Concept <i>Students can...</i>
Concept #1: Contact Forces 4.7	<ul style="list-style-type: none"> <li>• Plan and conduct a descriptive investigation: <ul style="list-style-type: none"> <li>○ Ask questions to conduct descriptive investigations about contact forces (pushes, pulls, and friction)</li> <li>○ Collect observations and measurements as evidence by conducting fair tests to increase reliability of the results.</li> <li>○ Construct appropriate data tables and charts.</li> </ul> </li> <li>• Develop models to represent how contact forces (pushes, pulls, and friction) interact with objects.</li> <li>• Develop explanations for how contact forces (pushes, pulls, and friction) affect the pattern of an object's motion.</li> <li>• Construct an argument with evidence that supports a claim about how contact forces (pushes, pulls, and friction) affect the pattern of an object's motion.</li> </ul>
Concept #2: Forces that Act at a Distance 4.7	<ul style="list-style-type: none"> <li>• Plan and conduct a descriptive investigation: <ul style="list-style-type: none"> <li>○ Ask questions to conduct descriptive investigations about forces that act at a distance (gravity and magnetism)</li> <li>○ Collect observations and measurements as evidence by conducting fair tests to increase reliability of the results.</li> <li>○ Construct appropriate data tables and charts.</li> </ul> </li> </ul>

	<ul style="list-style-type: none"><li>• Develop models to represent how forces that act at a distance (gravity and magnetism) interact with objects.</li><li>• Develop explanations for how forces that act at a distance (gravity and magnetism) affect the pattern of an object's motion.</li><li>• Construct an argument with evidence that supports a claim about how forces that act at a distance (gravity and magnetism) affect the pattern of an object's motion.</li></ul>
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## Grading Period 2

### Unit 3: Energy

Estimated Date Range: 10/16/24 – 11/22/24

Estimated Time Frame: 26 Days

#### Unit Overview:

In this unit, students will continue to build their understanding about energy by investigating the different ways it is perceived, which include mechanical, light, thermal, electrical, and sound by focusing on how energy transfer from place to place through systems. First, students will learn how energy transfer from place to place by objects in motion, waves in water, and sound. They will continue to explore the idea of transfer of energy by investigating how energy transfer within a system while exploring circuits that produce light and thermal energy. Students will build on their understanding of circuits in Grade 5. Lastly, as students explore thermal and electrical energy, they observe the behavior of different materials to identify patterns and label the materials as conductors or insulators.

#### At home connections:

- Encourage your child to find house items such a TV, microwave, lamp, etc. and discuss the type of energy the item uses, and how it transfers through the system.
- Help your child create virtual circuits [here](#). Engage in discussions about what makes the circuit work.
- Investigate what materials conduct and insulate thermal or electrical energy by testing different materials. For example, help your child add warm water to plastic cup and a foam cup. Compare how the cups feel from outside to determine what material is the best insulator of thermal energy.

#### Concepts within Unit #3

[Link to TEKS](#)

#### Success Criteria for this Concept

*Students can...*

Concept #1: Transfer of Energy  
4.8A

- Use evidence to develop models representing how energy transfer through systems by objects in motion, waves in water, and sound.
- Use evidence to develop explanations describing how energy transfer through systems by objects in motion, waves in water, and sound.

Concept #2: Electrical Energy  
4.8C

- Use models to describe how electrical energy transfers or travels through electric currents in a closed path.
- Use models to describe how electrical energy in a closed circuit can produce light and thermal energy.
- Analyze circuit models to describe if the circuits work by transferring electrical energy in a closed path and producing light and thermal energy.

Concept #3: Conductors and Insulators  
4.8B

- Analyze evidence to identify patterns about how well some materials transfer electrical and thermal energy.
- Identify materials as conductors or insulators of thermal and electrical energy based on their ability to transfer energy.

### 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 their understanding about processes on Earth that create patterns of change. These processes include seasons and the appearance of the Moon. More specifically students will learn how to collect and analyze data that will reveal patterns within seasons related to temperature, length of the day, and apparent movement of the Sun in the sky. Furthermore, students will learn to collect and analyze data that will reveal a pattern of the appearance of the Moon throughout a month. Students will build on this understanding in Grade 5 when they learn about day and night, shadows, and the rotation of Earth on its axis.

**At home connections:**

- Help your child gather historical data from the same city during winter and summer. Analyze the data about the amount of daylight hours in each season with your child. Visit the “History” tab from the [Weather Underground Site](#) to gather the data.
- Help your child gather data about the appearance of the Moon from Earth. Analyze the data collected with your child. Visit the [Daily Moon Site](#) from NASA to gather the data.

Concepts within Unit #4 <a href="#">Link to TEKS</a>	Success Criteria for this Concept <i>Students can...</i>
Concept #1: Patterns in Seasons 4.9A	<ul style="list-style-type: none"> <li>• Collect data of the length of daylight, temperature, and apparent position of the Sun in the Sky to identify and describe patterns that can be predicted.</li> <li>• Analyze data at different times of the year to relate the length of daylight, temperature, and apparent position of the Sun in the sky to seasons.</li> <li>• Predict seasonal patterns in the length of daylight, temperature, and apparent position of the Sun.</li> </ul>
Concept #2: Appearance of the Moon 4.9B	<ul style="list-style-type: none"> <li>• Collect data of the appearance of the Moon to identify and describe patterns that can be predicted.</li> <li>• Analyze data at different times of the month to relate the appearance of the Moon to the Moon’s revolution around Earth.</li> <li>• Predict patterns in the appearance of the Moon within a month.</li> </ul>

## Grading Period 3

### Unit 5: Processes and Patterns on Earth

Estimated Date Range: 1/09/25 – 2/13/25

Estimated Time Frame: 25 Days

#### Unit Overview:

In this unit, students will study different processes and patterns that occur on Earth. When exploring the water cycle, students will create models to identify each part of the water cycle. This is the first year in elementary that students will be studying the concept of the water cycle. In previous years, students have learned that water evaporates and condenses as a physical change of water. In addition, students will investigate slow changes to Earth's surface due to wind, water, and ice through weathering, erosion, and deposition. Students will construct models to understand these processes and will be able to analyze them to study their limitations. When studying weather, students are expected to know the difference between weather and climate. This is the first time that elementary students will encounter the concept of climate. In order to differentiate between these two concepts, students will need to examine data tables to identify that weather refers to the everyday changes in conditions of the atmosphere, while climate refers to patterns on those conditions over time.

#### At home connections:

- Help your child construct 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 where the water goes after being evaporated by the energy from the Sun.
- 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.
- Help your child distinguish between weather data and climate data by examining a weather site such as [Weather Underground](#). Select a city and observe the data presented (weather data – shows the weather conditions at the time). Explore the history tab and examine the data presented (climate data – shows the average weather conditions overtime).

#### Concepts within Unit #5

[Link to TEKS](#)

#### Success Criteria for this concept

*Students can...*

Concept #1: The Water Cycle  
4.10A

- Illustrate and describes the continuous movement of water through the processes of evaporation, condensation, precipitation, runoff, and accumulation.
- Explain the role of the Sun in the water cycle.

Concept #2: Slow Changes to Earth's Surface  
4.10B

- Identify slow changes to Earth's surface caused by weathering, erosion, and deposition from water, wind, and ice.

Concept #3: Weather and Climate  
4.10C

- Distinguish between weather and climate.

### Unit 6: Natural Resources and their Management

Estimated Date Range: 2/18/25 – 3/07/25

Estimated Time Frame: 13 Days

#### Unit Overview:

In this unit, students will understand how natural resources are important and can be managed. When studying natural resources, students will identify and explain the advantages and disadvantages of renewable and nonrenewable resources. In addition, students will study the characteristics of the rocks that store some of these resources under Earth's surface. Furthermore, students will explain the critical role that some of these energy resources play to modern life and how conservation, disposal, and recycling of natural resources impact the environment.

**At home connections:**

- Play a game with your child to determine who can name the most renewable and nonrenewable resources. Take the opportunity to discuss that the renewable resources are those that can be replaced in a human lifetime such as plants, animals. Non-renewable resources cannot be replaced in a human lifetime, for example, natural gas and fossil fuels.

Concepts within Unit #6 <a href="#">Link to TEKS</a>	Success Criteria for this concept <i>Students can...</i>
Concept #1: Natural Resources 4.11A, 4.11C	<ul style="list-style-type: none"> <li>• Classify Earth's natural resources into renewable resources and nonrenewable resources.</li> <li>• Explain the importance of conserving Earth's natural resources.</li> </ul>
Concept #2: Management of Natural Resources 4.11B	<ul style="list-style-type: none"> <li>• Explain the critical role of energy resources to modern life.</li> <li>• Explain how conservation, disposal, and recycling of natural resources impact the environment.</li> </ul>



## Grading Period 4

### Unit 7: Interactions within Environments

Estimated Date Range: 3/17/25 – 4/17/25

Estimated Time Frame: 23 Days

#### Unit Overview:

In this unit, students will learn that living organisms within an ecosystem interact with one another and with their environment. Students will study how producers need sunlight, water, and carbon dioxide to produce their own food. Consumers depend on other organisms for food to survive. In addition, students will learn how the flow of energy in an ecosystem begins with the Sun and is transferred from organism to organism in chains and food webs. Furthermore, students will recognize the role of fossils in understanding how ecosystems have changed over long periods of time.

#### At home connections:

- Discuss with your child that fossils give us clues of the past environments that existed in the past. Finding fossils of fish and shells buried deep in the ground is evidence that the current environment was under water thoughts of years ago. Finding fossils of palm trees is evidence that the current environment was a fertile environment with warm weather.
- Encourage your child to think about the food chains and food webs that can be formed with the animals and plants that live in an environment. 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 <a href="#">Link to TEKS</a>	Success Criteria for this Concept <i>Students can...</i>
Concept #1: Cycling of Matter in Plants 4.12A	<ul style="list-style-type: none"> <li>• Explain that producers make their own food through the process of photosynthesis.</li> <li>• Explain how matter cycles as plants make their own food.</li> </ul>
Concept #2: Cycling of Matter and Energy Flow in Food Webs 4.12B	<ul style="list-style-type: none"> <li>• Describe how energy flow in ecosystems through food webs.</li> <li>• Describe how matter cycles in ecosystems.</li> <li>• Describe the role of the Sun, producers, consumers, and decomposers in ecosystems.</li> </ul>
Concept #3: Past Environments 4.12C	<ul style="list-style-type: none"> <li>• Identify fossils as evidence of past living organisms and the nature of the environments at the time by using models and diagrams.</li> </ul>

### Unit 8: Structures and Growth of Organisms

Estimated Date Range: 4/22/25 – 5/16/25

Estimated Time Frame: 19 Days

#### Unit Overview:

In this unit, students will learn that organisms undergo similar life processes and have structures that help them survive within their environment. Students will study how the structures and functions of plants include physical characteristics that allow them to survive in their environment. Students will also explore examples of the traits that are passed from parents to offspring (inherited traits) and those traits that organisms developed due to its environment (acquired traits).

#### At home connections:

- Students need to be able to explore 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. Discuss what they do (function). Repeat this with other animals and plants.
- Play a game with your child to list inherited traits (A characteristic that is passed from parents to offspring such as hair color, eye color, and animal fur) and acquired traits behaviors (A characteristic that an organism develops due to its environment). During the game, each participant will list the all the inherited traits they can think of. Then, participants will list all the acquired traits they can think of. The winner is the participant with the most correct answers.

Concepts within Unit #8 <a href="#">Link to TEKS</a>	Success Criteria for this Concept <i>Students can...</i>
Concept #1: Structures and Functions of Plants 4.13A	<ul style="list-style-type: none"> <li>Explain how structures and functions of plants enable them to survive in their environment.</li> </ul>
Concept #2: Inherited and Acquired Traits 4.13B	<ul style="list-style-type: none"> <li>Differentiate between inherited and acquired traits.</li> </ul>
<b>Unit 9: Making Connections</b> Estimated Date Range: 5/19/25 – 5/29/25 Estimated Time Frame: 8 Days	
<b>Unit Overview:</b> 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.	
<b>At home connections:</b> <ul style="list-style-type: none"> <li>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 <a href="#">here</a>.</li> </ul>	
Concepts within Unit #9 <a href="#">Link to TEKS</a>	Success Criteria for this Concept <i>Students can...</i>
Concept #1: Student Projects 4.1A, 4.1B, 4.1c, 4.1D, 4.1E, 4.1F, 4.1G, 4.2A, 4.2B, 4.2C, 4.2D, 4.3A, 4.3B, 4.3C, 4.4A, 4.4B	<ul style="list-style-type: none"> <li>Use critical thinking and scientific problem solving to make informed decisions.</li> <li>Analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning, and experimental and observational testing.</li> </ul>

## 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.
<a href="#">Pebble Go</a>	This resource provides access to books for reading and learning more about concepts in the science content.
<a href="#">Britannica School</a>	This is an information resource for elementary students. It has encyclopedia articles, multimedia, primary sources, games, and other learning resources that support student learning.
<a href="#">Ebsco Host</a>	This online reference system serves all content areas.
<a href="#">World Book</a>	World Book contains thousands of informational articles with stunning illustrations, videos, interactive maps, and activities.
<a href="#">National Geographic Kids</a>	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.

