Grade 8 Science
Overview
2026 – 2027

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 process standards describe ways in which students are expected to engage in 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

8.1A Ask questions and define problems based on observations or information from text, phenomena, models, or investigations.
8.1B Use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems.
8.1C Use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards.
8.1D Use appropriate tools such as graduated cylinders, metric rulers, periodic tables, balances, scales, thermometers, temperature probes, laboratory ware, timing devices, pH indicators, hot plates, models, microscopes, slides, life science models, petri dishes, dissecting kits, magnets, spring scales or force sensors, tools that model wave behavior, satellite images, hand lenses, and lab notebooks or journals.
8.1E Collect quantitative data using the International System of Units (SI) and qualitative data as evidence.
8.1F Construct appropriate tables, graphs, maps, and charts using repeated trials and means to organize data.
8.1G Develop and use models to represent phenomena, systems, processes, or solutions to engineering problems.
8.1H Distinguish between scientific hypotheses, theories, and laws.
8.2A Identify advantages and limitations of models such as their size, properties, and materials.
8.2B Analyze data by identifying any significant descriptive statistical features, patterns, sources of error, or limitations.
8.2C Use mathematical calculations to assess quantitative relationships in data.
8.2D Evaluate experimental and engineering designs.
8.3A Develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories.
8.3B Communicate explanations and solutions individually and collaboratively in a variety of settings and formats.
8.3C Engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.

8.4A Relate the impact of past and current research on scientific thought and society, including the process of science, cost-benefit analysis, and contributions of diverse scientists as related to the content.
8.4B Make informed decisions by evaluating evidence from multiple appropriate sources to assess the credibility, accuracy, cost-effectiveness, and methods used.
8.4C 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):
8.5A Identify and apply patterns to understand and connect scientific phenomena or to design solutions.
8.5B Identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems.
8.5C Analyze how differences in scale, proportion, or quantity affect a system's structure or performance.
8.5D Examine and model the parts of a system and their interdependence in the function of the system.
8.5E Analyze and explain how energy flows and matter cycles through systems and how energy and matter are conserved through a variety of systems.
8.5F Analyze and explain the complementary relationship between the structure and function of objects, organisms, and systems.
8.5G Analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.

Grading Period 1

Unit 1: Matter

Estimated Time Frame: August 11 – September 18 (28 total school days)
Instructional & Re-engagement Days in Unit: 25 days

Assessments

State/National Assessment	District Assessment(s)	District Formative Assessment Window
N/A	**NWEA MAP Growth Science:** Grade 6, 7, and 8 – September 16 & 17	Unit 1, Concept 2 September 2 – September 10 (1 day)

Unit Overview:
In this unit, students will learn how matter is classified into elements, compounds, homogeneous mixtures, and heterogeneous mixtures based on their composition and properties. Furthermore, students will explore the unique properties of water, including cohesion, adhesion, and surface tension, and observe how these properties manifest in real-life phenomena such as droplet formation and plant transport. Also, students will compare the properties of acids and bases, understanding their differences in taste, behavior with litmus paper, and pH relative to water.

Finally, students will investigate the conservation of mass in chemical reactions, recognizing that matter is neither created nor destroyed but rearranged into different combinations, illustrating the fundamental principle of the law of conservation of mass. By using the periodic table as a tool, students will identify the atoms involved in chemical reactions, gaining insight into how elements interact and combine to form new substances.

At home connections:
Safety

- **Science Safety at Home:** Identify three household products with warning labels and discuss how following the directions helps prevent accidents.

Concept 1: Classification of Matter

- **Matter Hunt:** Identify several items at home and classify each as an element, compound, homogeneous mixture, or heterogeneous mixture.
- **Mixtures in the Kitchen:** Examine foods or drinks in the kitchen and determine whether each mixture is homogeneous or heterogeneous. Explain the evidence for each classification.

Concept 2: Properties of Water

- **Water Droplets:** Observe water droplets on a window, leaf, or countertop and discuss how cohesion, adhesion, and surface tension help explain their shape and movement.
- **Water on the Move:** Observe water traveling through a paper towel, sponge, or plant and explain how water's properties allow it to move.

Concept 3: Acids and Bases

- **Everyday pH:** Research the pH of two common foods, drinks, or household products and classify each as acidic, basic, or neutral.
- **Compare Household Products:** Examine the labels of products such as vinegar, soap, or baking soda and discuss how their uses relate to their acidic or basic properties. Do not mix or test household products.

Concept 4: Conservation of Mass

- **Matter During Cooking:** Observe ingredients being combined during cooking and discuss why matter is still present even when the ingredients change in appearance.
- **Atoms Rearrange:** Choose an example such as rusting, baking, or photosynthesis and explain how atoms are rearranged while the total amount of matter is conserved.

Concepts within Unit #1 Link to Grade 8 Science TEKS	**Success Criteria for this concept** *Students will…*
Concept #1: Safety (ongoing; embedded throughout the course) 8.1C	• identify and follow safe practices when working with materials and equipment during science investigations.

Concept #1: Classification of Matter
 	
8.6A
	• identify pure substances and mixtures.
	• describe the properties of elements, compounds, homogeneous mixtures, and heterogeneous mixtures.
	• classify real-world examples of matter into elements, compounds, homogeneous mixtures, and heterogeneous mixtures.
	• use models to identify cause-and-effect relationships showing how matter is classified as
	  ○ elements
	  ○ compounds
	  ○ homogenous mixtures
	  ○ heterogenous mixtures
	• create an explanation demonstrating how to classify the arrangement of particles as:
	  ○ Elements
	  ○ Compounds
	  ○ Homogenous mixtures
	  ○ Heterogenous mixtures

Concept #2: Properties of Water 8.6C	• describe cohesion, adhesion, and surface tension as properties of water. • identify examples of each property in observable phenomena (e.g., droplets, plant transport, floating objects). • use evidence from investigations to explain how these properties affect water's behavior. • compare how water interacts with itself and other materials to distinguish between cohesion and adhesion. • describe the cause-and-effect relationship between water's molecular behavior and observable effects like droplet formation.
Concept #3: Acids and Bases 8.6D	• identify and compare patterns in the properties of acids and bases based on their pH levels. • use pH data to determine whether a substance is an acid, base, or neutral when compared to water. • design and carry out an investigation to test how acids and bases react with indicators. • explain how pH changes during a neutralization reaction using evidence from the investigation. • describe the cause-and-effect relationship between the strength of an acid or base and the color change of an indicator.
Concept #4: Conservation of Mass 8.6E **DFA #1** **TEKS: 8.6E** **Window:** September 9 – September 14	• use models to show how atoms are rearranged in a chemical reaction and how mass is conserved. • develop explanations about the conservation of mass in a chemical reaction using data from a model or investigation. • identify atoms in a chemical reaction by analyzing chemical formulas and using the Periodic Table. • describe how the same kinds and number of atoms are still there after a chemical reaction, even though they are put together in new ways. (*Stability and Change) • describe the relationship between how atoms are rearranged during a chemical reaction and what happens to the total mass**.** • recognize patterns in how atoms combine and rearrange in different chemical reactions.

Unit 2: Force and Motion

Estimated Date Range: September 21 – October 8 (13 total days)
Instructional & Re-engagement Days in Unit: 12 days

Assessments

State/National Assessment	District Assessment(s)	District Formative Assessment Window:
N/A	N/A	Unit 2, Concept 2 October 2 – October 8 (only 1 day)

Unit Overview:

In this unit, 8th-grade students explore the intricacies of motion through the lens of Newton's laws. The focus begins with students delving into Newton's Second Law of Motion, learning to calculate and analyze the relationship between an object's acceleration, the net force acting on it, and its mass. They engage in hands-on experiments and problem-solving activities to apply the formula F=ma, demonstrating how varying the force or mass affects acceleration. By connecting these calculations to everyday scenarios and technological applications, students gain a robust understanding of the principles that dictate motion in our world, preparing them for more advanced studies in physics. Students explored Newton's Third Law of Motion in 6th grade and Newton's First Law of Motion in 8th grade.

Building on this foundation, of Newton's Laws of Motion, students investigate how they act simultaneously within various systems. Students examine real-world applications such as vehicle restraints, where seat belts demonstrate Newton's First Law by restraining passengers during sudden stops. In sports activities, they explore how players use Newton's Second Law to enhance performance, applying force to change the motion of balls and equipment. Amusement park rides provide vivid examples of all three laws, showcasing inertia, acceleration, and action-reaction forces. Additionally, the unit covers Earth's tectonic activities and

At Home Connections:

Concept 1: Newton's Second Law—Acceleration

- **Mass and Motion:** Compare the effort needed to push an empty and a full laundry basket. Explain how mass affects acceleration when a force is applied.
- **Changing the Force:** Push the same safe household object gently and then with more force. Describe how changing the force affects its acceleration.

Concept 2: Newton's Three Laws of Motion

- **Laws in Everyday Life:** Identify examples of Newton's three laws while riding in a vehicle, walking, playing sports, or moving objects.
- **Vehicle Safety:** Discuss how seat belts, headrests, and airbags relate to Newton's laws and help protect passengers.

Concepts within Unit #2 Link to Grade 8 Science TEKS	**Success Criteria for this concept** *Students will…*
Concept #1: Newton's Second Law 8.7A	• use the formula F=ma to calculate force, mass, or acceleration. • measure the acceleration of objects with different masses when a constant force is applied. • analyze data from experiments to explain how changes in force and mass affect an object's acceleration. • solve problems involving Newton's Second Law by calculating the net force, mass, or acceleration of an object in various scenarios. • apply understanding of Newton's Second Law to real-life situations, explaining how it affects the motion of objects in everyday activities.
Concept #2: Newton's Three Laws of Motion 8.7B **DFA #2** **TEKS: 8.7A and 8.7B** **Window:** October 2 – October 8	• Explain how all three of Newton's laws work together in real-world systems, like during an earthquake or a rocket launch. • Create models to show how Newton's laws work simultaneously in different scenarios and provide explanations based on your observations.

Grading Period 2

Unit 3: Waves

Estimated Date Range: October 19 – November 13 (20 total school days)
Instructional & Re-engagement Days in Unit: 19 days

Assessments

State/National Assessment	District Assessment(s)	District Formative Assessment Window:
PSAT – October 27	N/A	Unit 3, Concept 3 November 16 – November 20 (1 day)

Unit Overview:

In this unit, students explore the fundamental characteristics and applications of transverse waves, with a particular focus on the electromagnetic spectrum. Students begin by comparing the key properties of amplitude, frequency, and wavelength in transverse waves. They learn that amplitude refers to the height of the wave, indicating its energy; frequency is the number of waves that pass a point in a given period, determining the wave's pitch or color; and wavelength is the distance between successive wave crests, influencing the type of wave within the electromagnetic spectrum. Through hands-on activities and visual aids, students observe these properties and understand their interrelationships, gaining a solid foundation in wave dynamics.

Building on this foundation, students delve into the diverse applications of electromagnetic waves. They examine how different parts of the electromagnetic spectrum are utilized in various technologies and processes. For example, they explore the use of radiation therapy in medical treatments, wireless technologies for communication, fiber optics for data transmission, and microwaves for cooking. Additionally, students learn about the role of ultraviolet waves in sterilization, the importance of different wavelengths in astronomical observations, and the diagnostic power of X-rays.

At home connections:

Concept 1: Characteristics of Waves

- **Sound Comparison:** Listen to different sounds and compare their pitch and loudness. Relate pitch to frequency and loudness to amplitude.
- **Model a Wave:** Use a rope, cord, or flexible spring with adult supervision to create waves with different amplitudes and frequencies. Describe what changes.

Concept 2: Electromagnetic Spectrum

- **Electromagnetic Waves at Home:** Identify devices or activities that involve radio waves, microwaves, infrared, visible light, or ultraviolet radiation.
- **Compare the Spectrum:** Select two types of electromagnetic waves and compare their relative wavelengths, frequencies, and common uses.

Concept 3: Applications of Electromagnetic Waves

- **Technology Connections:** Choose two technologies—such as Wi-Fi, a microwave oven, remote control, X-ray imaging, or fiber optics—and explain how each uses electromagnetic waves.
- **Benefits and Safety:** Discuss one beneficial use of electromagnetic waves and the safety practices associated with that use.

Concepts within Unit # 3 Link to Grade 8 Science TEKS	Success criteria for this concept *Students will…*

Concept #1 Characteristics of Waves 8.8A	• identify properties of transverse waves. • identify examples of transverse waves in real-world contexts. • create and use models to represent the properties of transverse waves, including amplitude, frequency, and wavelength. • analyze data from wave models to identify patterns in wave behavior and characteristics. • explain the patterns observed in the data and how they relate to the properties of transverse waves. • compare different transverse waves by examining their amplitude, frequency, and wavelength to identify similarities and differences.
Concept #2: Electromagnetic Spectrum 8.8A	• identify different types of electromagnetic waves, like radio waves, microwaves, visible light, and X-rays. • explain what wavelengths and frequencies are in the electromagnetic spectrum. • categorize electromagnetic waves based on their wavelengths. • categorize electromagnetic waves based on their frequencies. • identify patterns in different types of electromagnetic waves based on their frequency, wavelength, and amplitude. •
Concept #3: Application of Electromagnetic Waves 6.8B	• identify different types of electromagnetic waves and describe their key properties. • data and models to explain why certain electromagnetic waves are chosen for specific applications. • describe how the characteristics of electromagnetic waves, like frequency and wavelength, affect their behavior. • explain why the properties of electromagnetic waves make them suitable for specific uses.

Unit 4: Seasons and Tides

Estimated Time Frame: November 30 – December 18 (15 total school days includes 4 days for exam schedule)
Instructional & Re-engagement Days in Unit: 11 days

- **Note:** Unit 4 Concept 2 is in Grading Period 3

Assessments

State/National Assessment	District Assessment(s)	District Formative Assessment Window:	Final Exam Review:
N/A	N/A	N/A	Dec. 7 - 11 **Final Exam Schedule**: 14 - 18

Unit Overview:

In this unit, students embark on a journey through the cosmos, exploring the fascinating life cycle of stars, the classification of galaxies, and the scientific theories describing the origin of the universe. The unit begins with an in-depth look at the life cycle of stars, from their birth in stellar nurseries to their various endpoints as white dwarfs, neutron stars, or black holes. Students use the Hertzsprung-Russell (H-R) diagram to compare and classify stars based on their luminosity, temperature, and size, understanding how these characteristics change over a star's lifetime. By plotting stars on the H-R diagram, they gain insights into the stages of stellar evolution and the diversity of stellar types.

The exploration continues with a focus on galaxies, where students learn to categorize them into spiral, elliptical, and irregular types. They study the distinctive features of each galaxy type and locate our own Milky Way galaxy within this framework. Students explore the structure of the Milky Way, identifying the position of Earth's solar system within one of its spiral arms. The unit culminates with students researching and analyzing scientific data supporting various theories and examining the evidence that has led to our current understanding of the universe.

events with terrestrial phenomena, enhancing their understanding of the interconnectedness of Earth's systems.

At home connections:

Concept 1: Stars

- **Star Characteristics:** Observe or research two stars and compare their color, temperature, brightness, and size.
- **Life Cycle of a Star:** Choose a low-, medium-, or high-mass star and explain the major stages of its life cycle to a family member.

Concept 2: Galaxies

- **Galaxy Classification:** Find images of spiral, elliptical, and irregular galaxies and identify the visible features used to classify each one.
- **Our Place in Space:** Describe Earth's location within the solar system, the Milky Way galaxy, and the universe.

Concept 3: Theories of the Universe

- **Evidence for Scientific Theories:** Research one type of evidence scientists use to explain the origin of the universe and summarize it for a family member.

Concepts within Unit #4 Link to Grade 8 Science TEKS	**Success Criteria for this concept** *Students will…*
Concept #1 Stars 8.9A **DFA #3** **TEKS: 8.9A** **Window:** November 19 – December 2	• describe the stages in the life cycle of a star, from its formation in a nebula to its end as a white dwarf, neutron star, or black hole. • use the Hertzsprung-Russell diagram to compare the luminosity, temperature, and size of different stars. • classify stars based on their position in the Hertzsprung-Russell diagram, identifying main sequence stars, giants, supergiants, and white dwarfs. • explain how a star's characteristics change as it moves through different stages of its life cycle. • provide examples of stars at different stages of their life cycle and plot them on the Hertzsprung-Russell diagram.
Concept #2 Galaxies 8.9B	• identify and describe the characteristics of spiral, elliptical, and irregular galaxies. • categorize images of galaxies into spiral, elliptical, and irregular types based on their shape and structure. • explain the structure of the Milky Way galaxy and identify the location of Earth's solar system within one of its spiral arms. • compare and contrast the features of different types of galaxies, including their shape, size, and star composition. • discuss how the classification of galaxies helps astronomers understand the universe's structure and evolution.
Concept #3 Theories of the Universe 8.9C	• explain how evidence, such as cosmic microwave background radiation and galaxy redshift, supports scientific theories about the universe. • analyze data to find patterns that support ideas about the universe's structure, motion, and changes over time. • research key discoveries that have shaped current scientific understanding of the universe. • describe how new evidence leads to changes or improvements in scientific ideas about the universe. • evaluate how scientific tools help gather evidence to better understand the universe.

Grading Period 3

Unit 5: Climate and Weather

Estimated Date Range: January 6 – February 10 (25 total school days)
Instructional & Re-engagement Days in Unit: 22 days

Assessments

State/National Assessment	District Assessment(s)	Common Formative Assessment Window
N/A	**NWEA MAP Growth:** **NWEA MAP Growth Science:** Grade 6, 7, and 8 – February 9 & 10	Unit 5, Concept 2 January 25 – January 29 (only 1 day)

Unit Overview:

In this unit, students investigate the dynamic interactions between solar energy, the hydrosphere, and the atmosphere, and how these interactions shape weather and climate. The unit begins with an exploration of how energy from the Sun drives weather patterns and climate systems. Students learn how solar radiation heats the Earth's surface unevenly, creating temperature gradients that influence atmospheric and oceanic circulation. By examining the roles of the hydrosphere and atmosphere, students gain a comprehensive understanding of how these spheres interact to distribute heat and moisture around the planet, leading to various weather phenomena and climate zones.

Building on this foundation, students delve into the study of global atmospheric movement patterns and their impact on local weather. They identify key features such as trade winds, jet streams, and prevailing westerlies, and analyze how these patterns drive weather systems and influence regional climates. The unit then focuses on the interactions between ocean currents and air masses, emphasizing their role in producing tropical cyclones, including typhoons and hurricanes. Students explore how warm ocean waters provide the energy necessary for cyclone formation and how atmospheric conditions steer and intensify these powerful storms.

At home connections:

Concept 1: Energy in the Atmosphere

- **Heating Earth's Surface:** Compare how sunlight warms different outdoor surfaces, such as grass, pavement, soil, or water. Discuss how this uneven heating may influence weather.
- **Sun, Water, and Air:** Observe the weather and explain how energy from the Sun interacts with water and the atmosphere to produce current conditions.

Concept 2: Global Patterns of Atmospheric Movement

- **Weather From Different Directions:** Use a weather map to identify the direction from which air is moving toward your area and discuss how it may influence local weather.
- **Global Wind Patterns:** Research one major global wind belt and explain how it affects weather in different regions.

Concept 3: Interactions Between Ocean and Weather Systems

- **Hurricane Conditions:** Examine a hurricane map or satellite image and identify how warm ocean water and moving air contribute to the storm.
- **Ocean Influence:** Compare the weather of a coastal location and an inland location and discuss how nearby ocean water may influence temperature and moisture.

Concepts within Unit # 5 Link to Grade 8 Science TEKS	Success Criteria for this concept *Students will…*
Concept #1 Energy in the Atmosphere 8.10A	• explain how solar energy drives the water cycle, including processes such as evaporation, condensation, and precipitation.

	• describe how the uneven heating of Earth's surface by solar radiation creates temperature variations and influences atmospheric circulation. • identify and explain the roles of the hydrosphere (oceans, lakes, rivers) and atmosphere in distributing heat and moisture around the Earth. • analyze how interactions between solar energy, the hydrosphere, and the atmosphere contribute to different weather patterns and climate zones. • Provide examples of how solar energy interacts with the atmosphere to produce weather phenomena such as wind patterns, storms, and temperature changes.
Concept #2: Global Patterns of Atmospheric Movement 8.10B **DFA #4** **TEKS: 8.10A** **Window:** January 25 – January 29	• describe how solar energy creates temperature differences that influence atmospheric circulation. • identify patterns in the movement of air caused by uneven heating of Earth's surface. • explain how air pressure differences create areas of high and low pressure and how this drives global wind patterns. • use models to demonstrate how solar energy and air pressure differences drive global wind patterns. • develop explanations of how global wind patterns, such as trade winds and westerlies, influence atmospheric movement. • identify and describe major global atmospheric circulation patterns, including trade winds, jet streams, and prevailing westerlies. • explain how high-pressure and low-pressure systems influence weather patterns and movement of air masses globally. • analyze how global atmospheric circulation patterns impact local weather conditions, including temperature, precipitation, and wind patterns. • use weather maps and data to predict and explain changes in local weather based on global atmospheric movements. • Identify how variations in global atmospheric circulation patterns influence weather changes in different parts of the world.
Concept #3: Interactions between Ocean and Weather Systems 8.10C	• explain how warm ocean currents provide energy for tropical cyclone formation. • describe the role of atmospheric conditions, such as low-pressure systems and high humidity, in the development and intensification of tropical cyclones. • Identify how interactions between warm ocean currents and atmospheric conditions lead to tropical cyclones forming. • analyze how interactions between ocean currents and atmospheric conditions contribute to the path and intensity of tropical cyclones. • Identify how variations in ocean and atmospheric conditions influence tropical cyclone characteristics in different regions.

Unit 6: Organisms

Estimated Date Range: February 11 – March 4 (14 total school days)
Instructional & Re-engagement Days in Unit: 13 days

Assessments

State/National Assessment	District Assessment(s)	District Formative Assessment Window:
TELPAS: February 15 – March 26	N/A	Unit 6, Concept 2 February 26 – March 4 (1 day only)

Unit Overview:

In this unit, students will explore how cell structures support cell function and how traits are inherited across generations. They will begin by investigating plant and animal cells, identifying key organelles, and explaining their roles in supporting life. Students will then examine how variations in traits influence survival, using models and real-world examples to explore structural, behavioral, and physiological adaptations. Through a lab investigation, students will analyze how different adaptations affect an organism's ability to survive in its environment.

By the end of the unit, students will understand how inherited traits and adaptations impact the survival and reproduction of organisms over time.

At home connections:

Concept 1: Cell Functions and Inherited Traits

- **Cell as a System:** Compare the functions of cell structures to parts of a home, school, or city. Explain how each part contributes to the whole system.
- **Family Traits:** Identify observable traits shared by family members and discuss how genes within chromosomes help determine inherited traits. Avoid using the activity to make conclusions about biological relationships.

Concept 2: Genetic Variation and Adaptations

- **Variation Within a Species:** Observe or research members of the same species and identify variations in their traits.
- **Adaptations and Survival:** Choose an organism and describe one structural, behavioral, and physiological adaptation that may improve its survival or reproductive success.

Concepts within Unit #6 Link to Grade 8 Science TEKS	**Success Criteria for this concept** *Students will…*
Concept #1 Cell Functions and Inherited Traits 8.13A, 8.13B	• identify key organelles in plant and animal cells and describe their function. • explain how different parts of a cell contribute to its survival. • describe how genetic information is organized and how it relates to traits. • identify patterns in traits and explain how they are inherited.
Concept #2: Genetic Variation and Adaptations 8.13C **DFA #5** **TEKS: 8.13A and 8.13C** Window: February 26 – March 4	• describe different types of adaptations and give examples of structural, behavioral, and physiological adaptations. • use models to explore how variations in traits affect an organism's ability to gather food or survive in its environment. • analyze data from investigations, such as the bird beak model, to determine which traits improve survival and why. • explain the cause-and-effect relationship between trait variations and an organism's ability to survive and reproduce. • use real-world examples to explain how adaptations help organisms survive and reproduce over generations.

Grading Period 4

Unit 7: Interactions within an Ecosystem

Estimated Date Range: March 15 – April 7 (17 total school days)
Instructional & Re-engagement Days in Unit: 17 days

Applying Concept Across Systems
Estimated Date Range: April 8 – April 19 (8 total school days)

Assessments

State/National Assessment	**District Assessment(s)**	**District Formative Assessment Window:**
TELPAS: February 15 – March 26	N/A	**N/A**

Unit Overview:

In this unit, students explore how ecosystems respond to disruptions and how biodiversity supports the stability and sustainability of those systems. They examine the flow of energy in food webs, the effects of ecological succession, and the importance of species variety in supporting healthy ecosystems.
Throughout this unit, students will:

- Analyze energy transfer within food webs and investigate how disruptions—such as population changes, natural disasters, or human activities—can interrupt the flow of energy and impact organism relationships within an ecosystem.
- Explore the process of ecological succession and describe how primary and secondary succession shape populations and species diversity over time. Students compare how these processes differ in speed and outcomes, depending on the presence of soil and organisms.
- Explain how biodiversity contributes to the health and sustainability of ecosystems. Students study how ecosystems with greater species variety are more resilient to change, better able to support organisms' needs, and more likely to maintain long-term stability.

Use models, data, and real-world examples to develop and communicate explanations about ecosystem interactions, recovery after disturbances, and the critical role of biodiversity in maintaining balance.

By the end of the unit, students will understand that ecosystems are complex systems influenced by internal and external factors, and that biodiversity plays a key role in helping ecosystems adapt, recover, and sustain life.

At home connections:
Concept 1: Flow of Energy

- **Food-Web Disruption:** Create a simple food chain and predict how a population change, natural disaster, or human action could affect energy transfer.
- **Local Ecosystem:** Choose a familiar ecosystem and identify its producers and consumers. Explain how energy moves through the system.

Concept 2: Changes in Ecosystems

- **Ecosystem Recovery:** Research an area affected by a fire, flood, volcanic eruption, farming, or construction and describe how organisms returned over time.
- **Primary or Secondary Succession:** Compare two disrupted ecosystems and determine whether each would undergo primary or secondary succession.

Concept 3: Stability in Ecosystems

- **Biodiversity Survey:** Observe the variety of plants and animals in a yard, neighborhood, or park and discuss how biodiversity supports ecosystem stability.
- **Changing Biodiversity:** Predict how the loss of one species could affect the health and sustainability of an ecosystem.

Concepts within Unit #7 Link to Grade 8 Science TEKS	**Success Criteria for this concept** *Students will…*
Concept #1 Flow of Energy 8.12A	• Identify examples of population changes, natural disasters, and human activities that disrupt ecosystems. • Analyze food web diagrams to explain how energy flow is affected when an organism is removed or overpopulates. • Describe how changes in one part of a food web can affect the entire ecosystem's stability. • Explain how invasive species, pollution, or habitat changes caused by humans can disrupt the transfer of energy in a food web. • (RTC: Stability and Change) • Use evidence from models to support explanations of how disruptions affect food web relationships.

Concept #2: Changes in Ecosystems 6.12B	• Describe the difference between primary and secondary succession, including the presence or absence of soil. • Identify how the number and variety of species change over time as an ecosystem recovers from a disruption. • Develop explanations about how different starting conditions (like soil or no soil) affect how quickly populations and species diversity return. • Communicate explanations using models to show how ecosystems become more stable over time through succession.
Concept #3: Stability in Ecosystems 8.12C	• Describe what biodiversity means and why it is important in an ecosystem. • Use a model to show how ecosystems with more species can stay balanced or recover after something changes. • Explain how biodiversity helps organisms get what they need to survive. • Communicate how ecosystems with more biodiversity can last longer and handle changes better than ecosystems with fewer species. • Give examples of ecosystems with high and low biodiversity and describe how they respond differently to changes or disruptions.

Unit 8: Impact on Global Climate

Estimated Date Range: April 20 – May 7 (13 total school days)
Instructional & Re-engagement Days in Unit: 10 days

Assessments

State/National Assessment	District Assessment(s)	District Formative Assessment Window
Social Studies STAAR: April 21 Math STAAR: April 26 – April 28 (1 day only)	**N/A**	**N/A**

Unit Overview:
In this unit, students examine how Earth's climate is influenced by both natural events and human activities over time. Students analyze scientific evidence to understand how energy, matter, and gases move through Earth's systems and how these processes affect long-term climate patterns.

The unit begins by focusing on natural events and Earth system processes that influence climate. Students investigate how events such as volcanic eruptions, meteor impacts, changes in ocean currents, and the release and absorption of greenhouse gases can alter atmospheric conditions. They also study the carbon cycle to understand how carbon moves between the atmosphere, hydrosphere, geosphere, and biosphere, and how this movement plays a role in regulating Earth's climate.

The unit then shifts to human activities and their influence on climate systems. Students use scientific evidence to describe how activities such as the release of greenhouse gases, deforestation, and urbanization affect Earth's energy balance and atmospheric conditions. Throughout the unit, students analyze data, interpret patterns, and construct explanations that connect natural and human-driven processes to observed climate impacts.
By the end of the unit, students will be able to use evidence to explain how interactions among Earth's systems influence climate, recognizing both natural processes and human activities as important factors.

At home connections:
Concept 1: Natural Events and Climate

- **Natural Climate Influences:** Choose a volcanic eruption, meteor impact, change in ocean currents, or natural greenhouse-gas change and explain how it can influence climate.
- **Follow the Carbon:** Trace carbon through the atmosphere, living organisms, water, soil, or rocks and explain how carbon moves through the system.

Concept 2: Human Activity and Climate

- **Community Climate Connections:** Identify examples of urbanization, transportation, energy use, or loss of trees in the community and discuss how they may influence climate.
- **Evidence and Action:** Find a credible source describing **how one human activity influences climate and identify one realistic action that could reduce its impact.**

Concepts within Unit #8 Link to Grade 8 Science TEKS	**Success Criteria for this concept** *Students will…*
Concept #1 Natural Events and Climate 8.11A, 8.11C	• develop and use models to show how volcanic eruption and greenhouse gases can change how energy moves through the Earth's atmosphere. • use data to identify patterns that show how changes in ocean currents or atmospheric conditions affect temperature. • use scientific evidence from investigations and observations to ex
Concept #2: Human Activity and Climate 8.11B	• explain how burning fuels or cutting down trees can change the amount of carbon dioxide in the atmosphere. • describe the cause-and-effect relationship between greenhouse gases and temperature. • use evidence from data to show patterns of stability and change over time. • explain how urbanization or land use changes can influence local weather patterns.

Student Projects (Teacher's Choice)

Estimated Date Range: May 10 – May 28 (14 total school days includes 4 days for final exam schedule)
Instructional & Re-engagement Days in Unit: 8 days

Assessments

State/National Assessment	**District Assessment(s)**	**Common Formative Assessment Window**	**Final Exam Review:**
N/A	**NWEA MAP Growth Science:** Grade 6, 7, and 8 – May 19 & 20	**N/A**	May 17 – 21 **Final Exam Schedule**: May 24 - 27

Concepts within the Unit	**TEKS**
Suggested Days: 10 (2 days for Science MAP testing.) **Click on the link below to see suggestions:** Student Projects – (see the 8th Grade Science Schoology home page)	Integrated Standards *Scientific and Engineering Practices* 8.1A ask questions and define problems based on observations or information from text, phenomena, models, or investigations. 8.1B use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems. 8.3 develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories. 8.4A relate the impact of past and current research on scientific thought and society, including the process of science, cost-benefit analysis, and contributions of diverse scientists as related to the content. 8.4C 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.

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.

Parent Resources

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

Resource	How it supports parent and students
Texas Experience Science Grade 8	This is the state adopted textbook for grade 8 science. Students sign in through their school account in Clever.
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.
Khan Academy	This resource contains practice exercises, instructional videos, and a personalized learning dashboard where students can learn and study at their own pace.
NSTA – Science Resources for Parents	This online resource has science activities for middle school students and their families to help support learning at home.
National Geographic Kids	This resource is a fact-filled, magazine created especially for ages 6 – 14. The students go on an amazing adventure in science, nature, culture, archaeology, and space.

Supplemental Resource and Tool designation

TI-Nspire Calculator	This calculator is a standardized technology integration tool used for Science and Mathematics in FBISD.

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.

