Texas Tutorials are designed specifically for the Texas Essential Knowledge and Skills (TEKS).

Science Tutorials offer targeted instruction, practice, and review designed to help students develop fluency, deepen conceptual understanding, and apply scientific thinking skills. Students engage with the content in an interactive, feedback-rich environment as they progress through standards-aligned modules. By constantly honing their ability to explain and analyze biological scenarios, students build the depth of knowledge and higher-order skills required to demonstrate their mastery when put to the test.

In each module, the Learn It and Try It make complex ideas accessible through focused content, guided analysis, multi-modal representations, and personalized feedback as students reason through increasingly challenging problems. The Review It offers a high-impact summary of key concepts and relates those concepts to students' lives. The Test It assesses students' mastery of the module's concepts, providing granular performance data to students and teachers after each attempt. To help students focus on the content most relevant to them, unit-level pretests and posttests can quickly identify where students are strong and where they're still learning.

## Unit 1: Nature of Science

- **WHAT IS SCIENCE?**
  - 7.4.A: Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. 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;
  - 7.1.A: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. ask questions and define problems based on observations or information from text, phenomena, models, or investigations;
  - 7.1.H: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. distinguish between scientific hypotheses, theories, and laws.
- **TYPES OF INVESTIGATIONS**
  - 7.1.E: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. collect quantitative data using the International System of Units (SI) and qualitative data as evidence;

- 7.1.B: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems;
- 7.1.D: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. 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;
- 7.2.D: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. evaluate experimental and engineering designs.
- 7.1.A: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. ask questions and define problems based on observations or information from text, phenomena, models, or investigations;

- **USING MODELS**
  - 7.2.A: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. identify advantages and limitations of models such as their size, scale, properties, and materials;
  - 7.1.G: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and
  - 7.2.C: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. use mathematical calculations to assess quantitative relationships in data; and
  - 7.5.C: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze how differences in scale, proportion, or quantity affect a system's structure or performance;

## Unit 2: Measurement and Data

- **TOOLS AND MEASUREMENT**

- 7.1.E: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. collect quantitative data using the International System of Units (SI) and qualitative data as evidence;
- 7.2.C: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. use mathematical calculations to assess quantitative relationships in data; and
- 7.1.D: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. 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;
- 7.1.E: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. collect quantitative data using the International System of Units (SI) and qualitative data as evidence;
- 7.1.D: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. 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;

- **DISPLAYING AND INTERPRETING DATA**
  - 7.1.E: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. collect quantitative data using the International System of Units (SI) and qualitative data as evidence;
  - 7.1.F: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. construct appropriate tables, graphs, maps, and charts using repeated trials and means to organize data;

- 7.7.C: Force, motion, and energy. The student describes the cause-and-effect relationship between force and motion. measure, record, and interpret an object's motion using distance-time graphs; and
- 7.2.B: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. analyze data by identifying any significant descriptive statistical features, patterns, sources of error, or limitations;

## Unit 3: Matter

- **WHAT IS MATTER?**
  - 7.6.A: Matter and energy. The student distinguishes between elements and compounds, classifies changes in matter, and understands the properties of solutions. compare and contrast elements and compounds in terms of atoms and molecules, chemical symbols, and chemical formulas;
  - 7.6.B: Matter and energy. The student distinguishes between elements and compounds, classifies changes in matter, and understands the properties of solutions. use the periodic table to identify the atoms and the number of each kind within a chemical formula;
- **MIXTURES OF MATTER**
  - 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;
  - 7.6.D: Matter and energy. The student distinguishes between elements and compounds, classifies changes in matter, and understands the properties of solutions. describe aqueous solutions in terms of solute and solvent, concentration, and dilution; and
  - 7.6.E: Matter and energy. The student distinguishes between elements and compounds, classifies changes in matter, and understands the properties of solutions. investigate and model how temperature, surface area, and agitation affect the rate of dissolution of solid solutes in aqueous solutions.
  - 7.1.B: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems;
  - 7.4.A: Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. 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;
- **PHYSICAL AND CHEMICAL CHANGES**
  - 7.5.B: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;

- 7.6.C: Matter and energy. The student distinguishes between elements and compounds, classifies changes in matter, and understands the properties of solutions. distinguish between physical and chemical changes in matter;

## Unit 4: Force and Motion

- **DESCRIBING MOTION**
  - 7.7.D: Force, motion, and energy. The student describes the cause-and-effect relationship between force and motion. analyze the effect of balanced and unbalanced forces on the state of motion of an object using Newton's First Law of Motion.
  - 7.7.C: Force, motion, and energy. The student describes the cause-and-effect relationship between force and motion. measure, record, and interpret an object's motion using distance-time graphs; and
  - 7.7.B: Force, motion, and energy. The student describes the cause-and-effect relationship between force and motion. distinguish between speed and velocity in linear motion in terms of distance, displacement, and direction;
  - 7.2.C: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. use mathematical calculations to assess quantitative relationships in data; and
  - 7.7.A: Force, motion, and energy. The student describes the cause-and-effect relationship between force and motion. calculate average speed using distance and time measurements from investigations;
- **DESCRIBING FORCES**
  - 7.5.D: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. examine and model the parts of a system and their interdependence in the function of the system;
  - 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;
  - 7.7.D: Force, motion, and energy. The student describes the cause-and-effect relationship between force and motion. analyze the effect of balanced and unbalanced forces on the state of motion of an object using Newton's First Law of Motion.
  - 7.2.C: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. use mathematical calculations to assess quantitative relationships in data; and
  - 7.3.B: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and
- **EFFECTS OF FORCES**

- 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;
- 7.7.D: Force, motion, and energy. The student describes the cause-and-effect relationship between force and motion. analyze the effect of balanced and unbalanced forces on the state of motion of an object using Newton's First Law of Motion.
- 7.5.B: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;
- 7.2.C: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. use mathematical calculations to assess quantitative relationships in data; and

## Unit 5: Thermal Energy

- **HEAT AND THERMAL ENERGY**
  - 7.1.E: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. collect quantitative data using the International System of Units (SI) and qualitative data as evidence;
  - 7.8.C: Force, motion, and energy. The student understands the behavior of thermal energy as it flows into and out of systems. explain the relationship between temperature and the kinetic energy of the particles within a substance.
  - 7.8.B: Force, motion, and energy. The student understands the behavior of thermal energy as it flows into and out of systems. investigate how thermal energy moves in a predictable pattern from warmer to cooler until all substances within the system reach thermal equilibrium; and
  - 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;
  - 7.8.A: Force, motion, and energy. The student understands the behavior of thermal energy as it flows into and out of systems. investigate methods of thermal energy transfer into and out of systems, including conduction, convection, and radiation;
- **THERMAL ENERGY AND TEMPERATURE**
  - 7.8.C: Force, motion, and energy. The student understands the behavior of thermal energy as it flows into and out of systems. explain the relationship between temperature and the kinetic energy of the particles within a substance.
  - 7.3.C: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. engage respectfully in scientific

argumentation using applied scientific explanations and empirical evidence.

## Unit 6: Earth's Place in Space

- **OUR SOLAR SYSTEM**
  - 7.1.G: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and
  - 7.4.A: Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. 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;
  - 7.9.B: Earth and space. The student understands the patterns of movement, organization, and characteristics of components of our solar system. describe how gravity governs motion within Earths solar system; and
  - 7.1.G: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and
  - 7.2.A: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. identify advantages and limitations of models such as their size, scale, properties, and materials;
  - 7.9.C: Earth and space. The student understands the patterns of movement, organization, and characteristics of components of our solar system. analyze the characteristics of Earth that allow life to exist such as the proximity of the Sun, presence of water, and composition of the atmosphere.
  - 7.9.A: Earth and space. The student understands the patterns of movement, organization, and characteristics of components of our solar system. describe the physical properties, locations, and movements of the Sun, planets, moons, meteors, asteroids, comets, Kuiper belt, and Oort cloud;
  - 7.5.D: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. examine and model the parts of a system and their interdependence in the function of the system;
- **THE ATMOSPHERE**
  - 7.1.G: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and

- 7.5.B: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;
- 7.9.C: Earth and space. The student understands the patterns of movement, organization, and characteristics of components of our solar system. analyze the characteristics of Earth that allow life to exist such as the proximity of the Sun, presence of water, and composition of the atmosphere.
- 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;
- 7.8.A: Force, motion, and energy. The student understands the behavior of thermal energy as it flows into and out of systems. investigate methods of thermal energy transfer into and out of systems, including conduction, convection, and radiation;
- 7.1.D: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. 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;

## Unit 7: Plate Tectonics

- **GEOLOGIC TIME**
  - 7.4.A: Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. 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;
  - 7.5.G: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.
  - 7.2.C: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. use mathematical calculations to assess quantitative relationships in data; and
  - 7.10.A: Earth and space. The student understands the causes and effects of plate tectonics. describe the evidence that supports that Earth has changed over time, including fossil evidence, plate tectonics, and superposition; and
- **PLATE TECTONICS**
  - 7.4.A: Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. 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;

- 7.5.B: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;
- 7.5.G: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.
- 7.5.E: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze and explain how energy flows and matter cycles through systems and how energy and matter are conserved through a variety of systems;
- 7.10.B: Earth and space. The student understands the causes and effects of plate tectonics. describe how plate tectonics causes ocean basin formation, earthquakes, mountain building, and volcanic eruptions, including supervolcanoes and hot spots.
- 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;
- 7.10.A: Earth and space. The student understands the causes and effects of plate tectonics. describe the evidence that supports that Earth has changed over time, including fossil evidence, plate tectonics, and superposition; and

- **EARTHQUAKES AND VOLCANOES**
  - 7.5.B: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;
  - 7.5.C: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze how differences in scale, proportion, or quantity affect a system's structure or performance;
  - 7.10.B: Earth and space. The student understands the causes and effects of plate tectonics. describe how plate tectonics causes ocean basin formation, earthquakes, mountain building, and volcanic eruptions, including supervolcanoes and hot spots.
  - 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;
  - 7.4.A: Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. 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;

- 7.2.C: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. use mathematical calculations to assess quantitative relationships in data; and
- 7.1.B: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems;
- 7.5.A: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. identify and apply patterns to understand and connect scientific phenomena or to design solutions;

## Unit 8: The Hydrosphere

- **FRESHWATER AND ICE**
  - 7.1.G: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and
  - 7.5.E: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze and explain how energy flows and matter cycles through systems and how energy and matter are conserved through a variety of systems;
  - 7.5.B: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;
  - 7.11.A: Earth and space. The student understands how human activity can impact the hydrosphere. analyze the beneficial and harmful influences of human activity on groundwater and surface water in a watershed; and
- **OCEANS**
  - 7.11.B: Earth and space. The student understands how human activity can impact the hydrosphere. describe human dependence and influence on ocean systems and explain how human activities impact these systems.
- **IMPACTS OF HUMANS**
  - 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;

- 7.5.B: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. identify and investigate cause-and-effect relationships to explain scientific phenomena or analyze problems;
- 7.3.B: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and
- 7.1.G: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and
- 7.11.A: Earth and space. The student understands how human activity can impact the hydrosphere. analyze the beneficial and harmful influences of human activity on groundwater and surface water in a watershed; and
- 7.2.D: Scientific and engineering practices. The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. evaluate experimental and engineering designs.

## Unit 9: The Nature and Interactions of Life

- **CHARACTERISTICS OF LIFE**
  - 7.13.B: Organisms and environments. The student knows how systems are organized and function to support the health of an organism and how traits are inherited. describe the hierarchical organization of cells, tissues, organs, and organ systems within plants and animals;
  - 7.5.G: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.
  - 7.13.C: Organisms and environments. The student knows how systems are organized and function to support the health of an organism and how traits are inherited. compare the results of asexual and sexual reproduction of plants and animals in relation to the diversity of offspring and the changes in the population over time; and
- **INTERACTIONS IN ECOSYSTEMS**
  - 7.5.D: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. examine and model the parts of a system and their interdependence in the function of the system;
  - 7.1.G: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and

- 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;
- 7.5.E: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze and explain how energy flows and matter cycles through systems and how energy and matter are conserved through a variety of systems;
- 7.12.A: Organisms and environments. The student understands that ecosystems are dependent upon the cycling of matter and the flow of energy. diagram the flow of energy within trophic levels and describe how the available energy decreases in successive trophic levels in energy pyramids; and
- 7.12.B: Organisms and environments. The student understands that ecosystems are dependent upon the cycling of matter and the flow of energy. describe how ecosystems are sustained by the continuous flow of energy and the recycling of matter and nutrients within the biosphere.

## Unit 10: Multicellular Organization

- **SPECIALIZED CELLS AND TISSUES**
  - 7.13.B: Organisms and environments. The student knows how systems are organized and function to support the health of an organism and how traits are inherited. describe the hierarchical organization of cells, tissues, organs, and organ systems within plants and animals;
  - 7.5.F: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze and explain the complementary relationship between structure and function of objects, organisms, and systems; and
- **ORGANS AND ORGAN SYSTEMS**
  - 7.13.B: Organisms and environments. The student knows how systems are organized and function to support the health of an organism and how traits are inherited. describe the hierarchical organization of cells, tissues, organs, and organ systems within plants and animals;
  - 7.5.F: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze and explain the complementary relationship between structure and function of objects, organisms, and systems; and
  - 7.5.D: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. examine and model the parts of a system and their interdependence in the function of the system;
  - 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;
- **HUMAN ORGAN SYSTEMS**
  - 7.13.A: Organisms and environments. The student knows how systems are organized and function to support the health of an organism and how traits are inherited. identify and model the main functions

of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, urinary, reproductive, integumentary, nervous, immune, and endocrine systems;

- 7.5.D: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. examine and model the parts of a system and their interdependence in the function of the system;
- 7.3.A: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;
- 7.5.G: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze and explain how factors or conditions impact stability and change in objects, organisms, and systems.

## Unit 11: Trait Inheritance

- **PATTERNS OF REPRODUCTION**
  - 7.13.C: Organisms and environments. The student knows how systems are organized and function to support the health of an organism and how traits are inherited. compare the results of asexual and sexual reproduction of plants and animals in relation to the diversity of offspring and the changes in the population over time; and
  - 7.13.A: Organisms and environments. The student knows how systems are organized and function to support the health of an organism and how traits are inherited. identify and model the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, urinary, reproductive, integumentary, nervous, immune, and endocrine systems;
- **BIOTECHNOLOGY**
  - 7.4.A: Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. 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;
  - 7.13.D: Organisms and environments. The student knows how systems are organized and function to support the health of an organism and how traits are inherited. describe and give examples of how natural and artificial selection change the occurrence of traits in a population over generations.
  - 7.3.C: Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.

## Unit 12: Taxonomy

- **DOMAINS AND KINGDOMS OF LIFE**
  - 7.14.A: Organisms and environments. The student knows how the taxonomic system is used to describe relationships between organisms. describe the taxonomic system that categorizes organisms based on similarities and differences shared among groups; and

- 7.14.B: Organisms and environments. The student knows how the taxonomic system is used to describe relationships between organisms. describe the characteristics of the recognized kingdoms and their importance in ecosystems such as bacteria aiding digestion or fungi decomposing organic matter.
- 7.5.F: Recurring themes and concepts. The student understands that recurring themes and concepts provide a framework for making connections across disciplines. analyze and explain the complementary relationship between structure and function of objects, organisms, and systems; and

- **CLASSIFICATION OF LIVING THINGS**
  - 7.4.A: Scientific and engineering practices. The student knows the contributions of scientists and recognizes the importance of scientific research and innovation on society. 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;
  - 7.14.A: Organisms and environments. The student knows how the taxonomic system is used to describe relationships between organisms. describe the taxonomic system that categorizes organisms based on similarities and differences shared among groups; and
  - 7.1.G: Scientific and engineering practices. The student, for at least 40 of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. develop and use models to represent phenomena, systems, processes, or solutions to engineering problems; and