

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?

- 7.3.D: Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.
- 7.3.A: Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the student;

### • TYPES OF INVESTIGATIONS

- 7.2.A: Scientific investigation and reasoning. The student uses scientific practices during laboratory and field investigations. plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology;
- 7.2.B: Scientific investigation and reasoning. The student uses scientific practices during laboratory and field investigations. design and implement experimental investigations by making observations, asking well defined questions, formulating testable hypotheses, and using appropriate equipment and technology;

### • USING MODELS

- 7.3.C: Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. identify advantages and limitations of models such as size, scale, properties, and materials; and
- 7.3.B: Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. use models to represent aspects of the natural world such as human body systems and plant and animal cells;

## Unit 2: Measurement and Data

### • TOOLS AND MEASUREMENT

- 7.2.C: Scientific investigation and reasoning. The student uses scientific practices during laboratory and field investigations. collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;
- 7.4.A: Science investigation and reasoning. The student knows how to use a variety of tools and safety equipment to conduct science inquiry. use appropriate tools, including life science models, hand lenses, stereoscopes, microscopes, beakers, Petri dishes, microscope slides, graduated cylinders, test tubes, meter sticks, metric rulers, metric tape measures, timing devices, hot plates, balances, thermometers, calculators, water test kits, computers, temperature and pH probes, collecting nets, insect traps, globes, digital cameras, journals/notebooks, and other necessary equipment to collect, record, and analyze information; and

### • DISPLAYING AND INTERPRETING DATA

- 7.2.B: Scientific investigation and reasoning. The student uses scientific practices during laboratory and field investigations. design and implement experimental investigations by making observations, asking well defined questions, formulating testable hypotheses, and using appropriate equipment and technology;
- 7.2.C: Scientific investigation and reasoning. The student uses scientific practices during laboratory and field investigations. collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers;
- 7.2.D: Scientific investigation and reasoning. The student uses scientific practices during laboratory and field investigations. construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and
- 7.2.E: Scientific investigation and reasoning. The student uses scientific practices during laboratory and field investigations. analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.

## Unit 3: Changes in Matter

### • PHYSICAL AND CHEMICAL CHANGES

- 7.6.A: Matter and energy. The student knows that matter has physical and chemical properties and can undergo physical and chemical changes. distinguish between physical and chemical

changes in matter.

- **CHANGES OF STATE**

- 7.6.A: Matter and energy. The student knows that matter has physical and chemical properties and can undergo physical and chemical changes. distinguish between physical and chemical changes in matter.

#### Unit 4: Changes to Matter on Earth

- **FRESHWATER AND ICE**

- 7.8.C: Earth and space. The student knows that natural events and human activity can impact Earth systems. model the effects of human activity on groundwater and surface water in a watershed.

- **WEATHERING AND EROSION**

- 7.8.B: Earth and space. The student knows that natural events and human activity can impact Earth systems. analyze the effects of weathering, erosion, and deposition on the environment in ecoregions of Texas; and

- **IMPACTS OF HUMANS**

- 7.8.C: Earth and space. The student knows that natural events and human activity can impact Earth systems. model the effects of human activity on groundwater and surface water in a watershed.

#### Unit 5: Earth's Place in Space

- **OUR SOLAR SYSTEM**

- 7.9.A: Earth and space. The student knows components of our solar system. analyze the characteristics of objects in our solar system that allow life to exist such as the proximity of the Sun, presence of water, and composition of the atmosphere; and

- **SPACE EXPLORATION**

- 7.9.B: Earth and space. The student knows components of our solar system. identify the accommodations, considering the characteristics of our solar system, that enabled manned space exploration.

#### Unit 6: Life on Earth

- **CHARACTERISTICS OF LIFE**

- 7.12.C: Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;
- 7.12.F: Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. recognize the components of cell theory.

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- **CHEMISTRY OF LIFE**

- 7.6.A: Matter and energy. The student knows that matter has physical and chemical properties and can undergo physical and chemical changes. distinguish between physical and chemical changes in matter.
- 7.7.A: Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy. illustrate the transformation of energy within an organism such as the transfer from chemical energy to thermal energy; and
- 7.5.B: Matter and energy. The student knows that interactions occur between matter and energy. diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.
- 7.5.A: Matter and energy. The student knows that interactions occur between matter and energy. recognize that radiant energy from the Sun is transformed into chemical energy through the process of photosynthesis; and
- 7.7.B: Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy. demonstrate and illustrate forces that affect motion in organisms such as emergence of seedlings, turgor pressure, geotropism, and circulation of blood.

- **CLASSIFICATION OF LIVING THINGS**

- 7.11.A: Organisms and environments. The student knows that populations and species demonstrate variation and inherit many of their unique traits through gradual processes over many generations. examine organisms or their structures such as insects or leaves and use dichotomous keys for identification;

## Unit 7: Cells

- **CELL STRUCTURE**

- 7.12.D: Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole;

- **CELL NUTRITION AND TRANSPORT**

- 7.5.B: Matter and energy. The student knows that interactions occur between matter and energy. diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.
- 7.7.A: Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy. illustrate the transformation of energy within an organism such as the transfer from chemical energy to thermal energy; and
- 7.12.D: Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole;

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- **CELL GROWTH AND REPRODUCTION**

- 7.14.B: Organisms and environments. The student knows that reproduction is a characteristic of living organisms and that the instructions for traits are governed in the genetic material. compare the results of uniform or diverse offspring from asexual or sexual reproduction; and

### Unit 8: Reproduction and Development

- **PATTERNS OF REPRODUCTION**

- 7.14.B: Organisms and environments. The student knows that reproduction is a characteristic of living organisms and that the instructions for traits are governed in the genetic material. compare the results of uniform or diverse offspring from asexual or sexual reproduction; and

- **LIFE CYCLES**

- 7.12.B: Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems;

### Unit 9: Genetics

- **INHERITANCE**

- 7.14.A: Organisms and environments. The student knows that reproduction is a characteristic of living organisms and that the instructions for traits are governed in the genetic material. define heredity as the passage of genetic instructions from one generation to the next generation;
- 7.14.C: Organisms and environments. The student knows that reproduction is a characteristic of living organisms and that the instructions for traits are governed in the genetic material. recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus.
- 7.3.D: Scientific investigation and reasoning. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists. relate the impact of research on scientific thought and society, including the history of science and contributions of scientists as related to the content.

- **GENES AND DNA**

- 7.14.C: Organisms and environments. The student knows that reproduction is a characteristic of living organisms and that the instructions for traits are governed in the genetic material. recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus.

- **BIOTECHNOLOGY**

- 7.11.C: Organisms and environments. The student knows that populations and species demonstrate variation and inherit many of their unique traits through gradual processes over many generations. identify some changes in genetic traits that have occurred over several

generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (*Geospiza fortis*) or domestic animals and hybrid plants.

## Unit 10: Multicellular Bodies

### • SPECIALIZED CELLS AND TISSUES

- 7.12.C: Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;
- 7.12.E: Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. compare the functions of cell organelles to the functions of an organ system; and

### • ORGANS AND ORGAN SYSTEMS

- 7.12.C: Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;
- 7.12.A: Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. investigate and explain how internal structures of organisms have adaptations that allow specific functions such as gills in fish, hollow bones in birds, or xylem in plants;

## Unit 11: The Human Body

### • HUMAN ORGAN SYSTEMS

- 7.6.A: Matter and energy. The student knows that matter has physical and chemical properties and can undergo physical and chemical changes. distinguish between physical and chemical changes in matter.
- 7.12.B: Organisms and environments. The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function. identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems;

### • DISEASE AND HUMAN HEALTH

- 7.13.B: Organisms and environments. The student knows that a living organism must be able to maintain balance in stable internal conditions in response to external and internal stimuli. describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance.

## Unit 12: Response to Stimuli

### • ANIMAL BEHAVIOR

- 7.13.A: Organisms and environments. The student knows that a living organism must be able to maintain balance in stable internal conditions in response to external and internal stimuli. investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight; and
  - 7.13.B: Organisms and environments. The student knows that a living organism must be able to maintain balance in stable internal conditions in response to external and internal stimuli. describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance.
- **PLANT RESPONSES**
    - 7.7.B: Force, motion, and energy. The student knows that there is a relationship among force, motion, and energy. demonstrate and illustrate forces that affect motion in organisms such as emergence of seedlings, turgor pressure, geotropism, and circulation of blood.
    - 7.13.A: Organisms and environments. The student knows that a living organism must be able to maintain balance in stable internal conditions in response to external and internal stimuli. investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight; and
    - 7.13.B: Organisms and environments. The student knows that a living organism must be able to maintain balance in stable internal conditions in response to external and internal stimuli. describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance.

### Unit 13: Evolution

- **THEORY OF EVOLUTION**
  - 7.11.C: Organisms and environments. The student knows that populations and species demonstrate variation and inherit many of their unique traits through gradual processes over many generations. identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (*Geospiza fortis*) or domestic animals and hybrid plants.
- **NATURAL SELECTION**
  - 7.11.B: Organisms and environments. The student knows that populations and species demonstrate variation and inherit many of their unique traits through gradual processes over many generations. explain variation within a population or species by comparing external features, behaviors, or physiology of organisms that enhance their survival such as migration, hibernation, or storage of food in a bulb; and
  - 7.11.C: Organisms and environments. The student knows that populations and species demonstrate variation and inherit many of their unique traits through gradual processes over many generations. identify some changes in genetic traits that have occurred over several generations through natural selection and selective breeding such as the Galapagos Medium Ground Finch (*Geospiza fortis*) or domestic animals and hybrid plants.

### Unit 14: Ecology



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- **CHARACTERISTICS OF ECOSYSTEMS**

- 7.5.B: Matter and energy. The student knows that interactions occur between matter and energy. diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.
- 7.10.A: Organisms and environments. The student knows that there is a relationship between organisms and the environment. observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms;

- **INTERACTIONS IN ECOSYSTEMS**

- 7.5.B: Matter and energy. The student knows that interactions occur between matter and energy. diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.
- 7.5.A: Matter and energy. The student knows that interactions occur between matter and energy. recognize that radiant energy from the Sun is transformed into chemical energy through the process of photosynthesis; and

- **SUCCESSION AND ECOSYSTEM STABILITY**

- 7.5.B: Matter and energy. The student knows that interactions occur between matter and energy. diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.
- 7.8.A: Earth and space. The student knows that natural events and human activity can impact Earth systems. predict and describe how catastrophic events such as floods, hurricanes, or tornadoes impact ecosystems;
- 7.10.C: Organisms and environments. The student knows that there is a relationship between organisms and the environment. observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds.
- 7.10.B: Organisms and environments. The student knows that there is a relationship between organisms and the environment. describe how biodiversity contributes to the sustainability of an ecosystem; and