

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.

1. NATURE OF SCIENCE

• WHAT IS SCIENCE?

- **7.3.D** 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** 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** plan and implement comparative and descriptive investigations by making observations, asking well defined questions, and using appropriate equipment and technology;
- **7.2.B** 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** identify advantages and limitations of models such as size, scale, properties, and materials; and
- **7.3.B** use models to represent aspects of the natural world such as human body systems and plant and animal cells;

2. MEASUREMENT AND DATA

• TOOLS AND MEASUREMENT

- **7.2.C** 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** 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** design and implement experimental investigations by making observations, asking well defined questions, formulating testable hypotheses, and using appropriate equipment and technology;
- **7.2.C** 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** construct tables and graphs, using repeated trials and means, to organize data and identify patterns; and
- **7.2.E** analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends.

3. CHANGES IN MATTER

- **PHYSICAL AND CHEMICAL CHANGES**

- **7.6.A** distinguish between physical and chemical changes in matter.

- **CHANGES OF STATE**

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4. CHANGES TO MATTER ON EARTH

- **FRESHWATER AND ICE**

- **7.8.C** model the effects of human activity on groundwater and surface water in a watershed.

- **WEATHERING AND EROSION**

- **7.8.B** analyze the effects of weathering, erosion, and deposition on the environment in ecoregions of Texas; and

- **IMPACTS OF HUMANS**

- **7.8.C** model the effects of human activity on groundwater and surface water in a watershed.

5. EARTH'S PLACE IN SPACE

- **OUR SOLAR SYSTEM**

- **7.9.A** 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** identify the accommodations, considering the characteristics of our solar system, that enabled manned space exploration.

6. LIFE ON EARTH

- **CHARACTERISTICS OF LIFE**

- **7.12.C** recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;
- **7.12.F** recognize the components of cell theory.

- **CHEMISTRY OF LIFE**

- **7.6.A** distinguish between physical and chemical changes in matter.
- **7.7.A** illustrate the transformation of energy within an organism such as the transfer from chemical energy to thermal energy; and
- **7.5.B** diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.
- **7.5.A** recognize that radiant energy from the Sun is transformed into chemical energy through the process of photosynthesis; and
- **7.7.B** 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** examine organisms or their structures such as insects or leaves and use dichotomous keys for identification;

7. CELLS

● CELL STRUCTURE

- **7.12.D** 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** diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.
- **7.7.A** illustrate the transformation of energy within an organism such as the transfer from chemical energy to thermal energy; and
- **7.12.D** differentiate between structure and function in plant and animal cell organelles, including cell membrane, cell wall, nucleus, cytoplasm, mitochondrion, chloroplast, and vacuole;

● CELL GROWTH AND REPRODUCTION

- **7.14.B** compare the results of uniform or diverse offspring from asexual or sexual reproduction; and

8. REPRODUCTION AND DEVELOPMENT

● PATTERNS OF REPRODUCTION

- **7.14.B** compare the results of uniform or diverse offspring from asexual or sexual reproduction; and

● LIFE CYCLES

- **7.12.B** 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;

9. GENETICS

● INHERITANCE

- **7.14.A** define heredity as the passage of genetic instructions from one generation to the next generation;
- **7.14.C** recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus.
- **7.3.D** 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** 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** 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.

10. MULTICELLULAR BODIES

● SPECIALIZED CELLS AND TISSUES

- **7.12.C** recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;
- **7.12.E** compare the functions of cell organelles to the functions of an organ system; and

● ORGANS AND ORGAN SYSTEMS

- **7.12.C** recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms;
- **7.12.A** 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;

11. THE HUMAN BODY

• HUMAN ORGAN SYSTEMS

- **7.6.A** distinguish between physical and chemical changes in matter.
- **7.12.B** 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** 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.

12. RESPONSE TO STIMULI

• ANIMAL BEHAVIOR

- **7.13.A** investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight; and
- **7.13.B** 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** demonstrate and illustrate forces that affect motion in organisms such as emergence of seedlings, turgor pressure, geotropism, and circulation of blood.
- **7.13.A** investigate how organisms respond to external stimuli found in the environment such as phototropism and fight or flight; and
- **7.13.B** 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.

13. EVOLUTION

• THEORY OF EVOLUTION

- **7.11.C** 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** 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** 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.

14. ECOLOGY

• CHARACTERISTICS OF ECOSYSTEMS

- **7.5.B** diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.
- **7.10.A** observe and describe how different environments, including microhabitats in schoolyards and biomes, support different varieties of organisms;

• INTERACTIONS IN ECOSYSTEMS

- **7.5.B** diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.
- **7.5.A** 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** *diagram the flow of energy through living systems, including food chains, food webs, and energy pyramids.*
- **7.8.A** *predict and describe how catastrophic events such as floods, hurricanes, or tornadoes impact ecosystems;*
- **7.10.C** *observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds.*
- **7.10.B** *describe how biodiversity contributes to the sustainability of an ecosystem; and*