

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?

- 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.
- 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

- 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;
- 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

- 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
- 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 an atom, a molecule, space, or a geologic feature;

Unit 2: Measurement and Data

• TOOLS AND MEASUREMENT

- 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;
- 4.A: Scientific investigation and reasoning. The student knows how to use a variety of tools and safety equipment to conduct science inquiry. use appropriate tools, including lab journals/notebooks, beakers, meter sticks, graduated cylinders, anemometers, psychrometers, hot plates, test tubes, spring scales, balances, microscopes, thermometers, calculators, computers, spectrosopes, timing devices, and other necessary equipment to collect, record, and analyze information; and

• DISPLAYING AND INTERPRETING DATA

- 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;
- 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;
- 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
- 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: Nature of Matter

• WHAT IS MATTER?

- 5.D: Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts; and

- **ATOMIC STRUCTURE**

- 5.B: Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity;
- 5.A: Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. describe the structure of atoms, including the masses, electrical charges, and locations, of protons and neutrons in the nucleus and electrons in the electron cloud;

- **ELEMENTS AND THE PERIODIC TABLE**

- 5.B: Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. identify that protons determine an element's identity and valence electrons determine its chemical properties, including reactivity;
- 5.C: Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. interpret the arrangement of the Periodic Table, including groups and periods, to explain how properties are used to classify elements;
- 6.B: Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. differentiate between speed, velocity, and acceleration; and
- 6.C: Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. investigate and describe applications of Newton's three laws of motion such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches.

Unit 4: Changes in Matter

- **HOW CAN MATTER CHANGE?**

- 5.E: Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. investigate how evidence of chemical reactions indicates that new substances with different properties are formed and how that relates to the law of conservation of mass.

- **CHEMICAL EQUATIONS**

- 5.D: Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. recognize that chemical formulas are used to identify substances and determine the number of atoms of each element in chemical formulas containing subscripts; and
- 5.E: Matter and energy. The student knows that matter is composed of atoms and has chemical and physical properties. investigate how evidence of chemical reactions indicates that new substances with different properties are formed and how that relates to the law of conservation of mass.

Unit 5: Force and Motion

- **DESCRIBING FORCES**

- 6.A: Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. demonstrate and calculate how unbalanced forces change the speed or direction of an object's motion;
- 6.C: Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. investigate and describe applications of Newton's three laws of motion such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches.

- **WHAT IS MOTION?**

- 6.B: Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. differentiate between speed, velocity, and acceleration; and
- 6.C: Force, motion, and energy. The student knows that there is a relationship between force, motion, and energy. investigate and describe applications of Newton's three laws of motion such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches.

Unit 6: Motion in Space

- **SUN-EARTH-MOON SYSTEM**

- 7.A: Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun, causing changes in seasons;
- 7.B: Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. demonstrate and predict the sequence of events in the lunar cycle; and
- 7.C: Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. relate the positions of the Moon and Sun to their effect on ocean tides.

- **OUR SUN AND OTHER STARS**

- 8.A: Earth and space. The student knows characteristics of the universe. describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification;
- 8.B: Earth and space. The student knows characteristics of the universe. recognize that the Sun is a medium-sized star located in a spiral arm of the Milky Way galaxy and that the Sun is many thousands of times closer to Earth than any other star;

- **THE UNIVERSE**

- 8.A: Earth and space. The student knows characteristics of the universe. describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification;
- 8.B: Earth and space. The student knows characteristics of the universe. recognize that the Sun is a medium-sized star located in a spiral arm of the Milky Way galaxy and that the Sun is many thousands of times closer to Earth than any other star;

- 8.C: Earth and space. The student knows characteristics of the universe. identify how different wavelengths of the electromagnetic spectrum such as visible light and radio waves are used to gain information about components in the universe; and
- 8.D: Earth and space. The student knows characteristics of the universe. research how scientific data are used as evidence to develop scientific theories to describe the origin of the universe.

Unit 7: Space Exploration Technology

• ELECTROMAGNETIC WAVES

- 8.C: Earth and space. The student knows characteristics of the universe. identify how different wavelengths of the electromagnetic spectrum such as visible light and radio waves are used to gain information about components in the universe; and

• WAVES AND TECHNOLOGY

- 8.C: Earth and space. The student knows characteristics of the universe. identify how different wavelengths of the electromagnetic spectrum such as visible light and radio waves are used to gain information about components in the universe; and

• SPACE EXPLORATION

- 8.C: Earth and space. The student knows characteristics of the universe. identify how different wavelengths of the electromagnetic spectrum such as visible light and radio waves are used to gain information about components in the universe; and

Unit 8: Exploring Earth

• MODELS OF EARTH

- 9.C: Earth and space. The student knows that natural events can impact Earth systems. interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering.

• THE ATMOSPHERE

- 10.A: Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds;

• OCEANS

- 10.A: Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds;
- 11.C: Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems.

Unit 9: Earth's Weather

- **WEATHER**

- 10.B: Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts; and
- 10.C: Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. identify the role of the oceans in the formation of weather systems such as hurricanes.

- **SEVERE WEATHER**

- 10.C: Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. identify the role of the oceans in the formation of weather systems such as hurricanes.

Unit 10: Climate and Impact of Humans

- **CLIMATE**

- 10.A: Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds;

- **IMPACTS OF HUMANS**

- 11.B: Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. explore how short- and long-term environmental changes affect organisms and traits in subsequent populations; and

Unit 11: Earth's Plates

- **PLATE TECTONICS**

- 9.B: Earth and space. The student knows that natural events can impact Earth systems. relate plate tectonics to the formation of crustal features; and
- 9.A: Earth and space. The student knows that natural events can impact Earth systems. describe the historical development of evidence that supports plate tectonic theory;

- **EARTHQUAKES AND VOLCANOES**

- 9.B: Earth and space. The student knows that natural events can impact Earth systems. relate plate tectonics to the formation of crustal features; and

Unit 12: Our Changing Planet

- **DEFORMING EARTH'S CRUST**

- 9.B: Earth and space. The student knows that natural events can impact Earth systems. relate plate tectonics to the formation of crustal features; and

- **WEATHERING AND EROSION**

- 9.C: Earth and space. The student knows that natural events can impact Earth systems. interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering.

- **GEOLOGIC TIME**

- 11.A: Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition;

Unit 13: Earth's Biosphere

- **CHARACTERISTICS OF ECOSYSTEMS**

- 11.A: Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition;

- **INTERACTIONS IN ECOSYSTEMS**

- 11.A: Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition;

Unit 14: Changes to Earth's Biosphere

- **SUCCESSION AND ECOSYSTEM STABILITY**

- 11.B: Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. explore how short- and long-term environmental changes affect organisms and traits in subsequent populations; and

- **NATURAL SELECTION**

- 11.A: Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. investigate how organisms and populations in an ecosystem depend on and may compete for biotic factors such as food and abiotic factors such as quantity of light, water, range of temperatures, or soil composition;
- 11.B: Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. explore how short- and long-term environmental changes affect organisms and traits in subsequent populations; and

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- 11.C: Organisms and environments. The student knows that interdependence occurs among living systems and the environment and that human activities can affect these systems. recognize human dependence on ocean systems and explain how human activities such as runoff, artificial reefs, or use of resources have modified these systems.
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