

A Sample of Current Texas Essential Knowledge & Skills Standards: Middle & High School

Using WorldWide Telescope to Explore the Solar System

Middle School TEKS

- Describe the physical properties, locations, and movements of the Sun, planets, Galilean moons, meteors, asteroids, and comets.
- Model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons.
- Demonstrate and predict the sequence of events in the lunar cycle.

High School TEKS

- Compare and contrast the scale, size, and distance of the Sun, Earth, and Moon system through the use of data and modeling.
- Compare and contrast the scale, size, and distance of objects in the solar system such as the Sun and planets through the use of data and modeling.
- Observe and record data about lunar phases and use that information to model the Sun, Earth, and Moon system.
- Illustrate the cause of lunar phases by showing positions of the Moon relative to Earth and the Sun for each phase, including new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, third quarter, and waning crescent.
- Identify and differentiate the causes of lunar and solar eclipses, including differentiating between lunar phases and eclipses.
- Recognize that seasons are caused by the tilt of Earth's axis.
- Recognize that the angle of incidence of sunlight determines the concentration of solar energy received on Earth at a particular location.
- Contrast the characteristics of comets, asteroids, and meteoroids and their positions in the solar system, including the orbital regions of the terrestrial planets, the asteroid belt, gas giants, Kuiper Belt, and Oort Cloud.

Using WorldWide Telescope to Explore the Universe

Middle School TEKS

- Describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification.
- Recognize that the Sun is a medium-sized star near the edge of a disc-shaped galaxy of stars and that the Sun is many thousands of times closer to Earth than any other star.
- Explore how different wavelengths of the electromagnetic spectrum such as light and radio waves are used to gain information about distances and properties of components in the universe.

High School TEKS

- Describe and explain the historical origins of the perceived patterns of constellations and the role of constellations in ancient and modern navigation.
- Recognize and identify constellations such as Ursa Major, Ursa Minor, Orion, Cassiopeia, and constellations of the zodiac.
- Examine the scale, size, and distance of the stars, Milky Way, and other galaxies through the use of data and modeling.
- Recognize the type, structure, and components of our Milky Way galaxy and location of our solar system within it.
- Compare and contrast the different types of galaxies, including spiral, elliptical, irregular, and dwarf.

Using WorldWide Telescope to create tours

Middle School TEKS

- The student formats digital information for appropriate and effective communication. The student is expected to:
 - use productivity tools to create effective document files for defined audiences such as slide shows, posters, multimedia presentations, newsletters, brochures, or reports.

The student delivers the product electronically in a variety of media, with appropriate supervision. The student is expected to:

- publish information in a variety of ways including, but not limited to, printed copy, monitor display, Internet documents, and video.
- design and create interdisciplinary multimedia presentations for defined audiences including audio, video, text, and graphics.

High School TEKS

- Demonstrate knowledge and appropriate use of operating systems, software applications, and communication and networking components.

- The student uses research skills and electronic communication, with appropriate supervision, to create new knowledge. The student is expected to:

- participate with electronic communities as a learner, initiator, contributor, and teacher/mentor;

- extend the learning environment beyond the school walls with digital products created to increase teaching and learning in the foundation and enrichment curricula; and

- participate in relevant, meaningful activities in the larger community and society to create electronic projects.

- The student delivers the product electronically in a variety of media, with appropriate supervision. The student is expected to:

- publish information in a variety of ways including, but not limited to, printed copy and monitor displays; and

- publish information in a variety of ways including, but not limited to, software, Internet documents, and video.

TEKS for Science Process Skills and Reasoning

Middle School TEKS

- Scientific investigations are conducted for different reasons. All investigations require a research question, careful observations, data gathering, and analysis of the data to identify the patterns that will explain the findings. Descriptive investigations are used to explore new phenomena such as conducting surveys of organisms or measuring the abiotic components in a given habitat. Descriptive statistics include frequency, range, mean, median, and mode. A hypothesis is not required in a descriptive investigation. On the other hand, when conditions can be controlled in order to focus on a single variable, experimental research design is used to determine causation. Students should experience both types of investigations and understand that different scientific research questions require different research designs.

- Scientific investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations, and the methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. Models have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

High School TEKS

- Scientific systems. A system is a collection of cycles, structures, and processes that interact. All systems have basic properties that can be described in terms of space, time, energy, and matter. Change and constancy occur in systems as patterns and can be observed, measured, and modeled. These patterns help to make predictions that can be scientifically tested. Students should analyze a system in terms of its components and how these components relate to each other, to the whole, and to the external environment.
- Communicate valid conclusions in writing, oral presentations, and through collaborative projects.
- Use astronomical technology such as telescopes, binoculars, sextants, computers, and software.