

EARTH SCIENCE TEKS BEGINNING 2010  
**ELEMENTARY**

**Science, Kindergarten**

**Introduction.**

(C) Weather is recorded and discussed on a daily basis so students may begin to recognize patterns in the weather. Other patterns are observed in the appearance of objects in the sky.

**Knowledge and skills.**

(7) Earth and space. The student knows that the natural world includes earth materials. The student is expected to:

- (A) observe, describe, compare, and sort rocks by size, shape, color, and texture;
- (B) observe and describe physical properties of natural sources of water, including color and clarity; and
- (C) give examples of ways rocks, soil, and water are useful.

(8) Earth and space. The student knows that there are recognizable patterns in the natural world and among objects in the sky. The student is expected to:

- (A) observe and describe weather changes from day to day and over seasons;
- (B) identify events that have repeating patterns, including seasons of the year and day and night; and
- (C) observe, describe, and illustrate objects in the sky such as the clouds, Moon, and stars, including the Sun.

**112.12. Science, Grade 1,**

**Knowledge and Skills**

(7) Earth and space. The student knows that the natural world includes rocks, soil, and water that can be observed in cycles, patterns, and systems. The student is expected to:

- (A) observe, compare, describe, and sort components of soil by size, texture, and color;
- (B) identify and describe a variety of natural sources of water, including streams, lakes, and oceans; and
- (C) gather evidence of how rocks, soil, and water help to make useful products.

(8) Earth and space. The student knows that the natural world includes the air around us and objects in the sky. The student is expected to:

- (A) record weather information, including relative temperature, such as hot or cold, clear or cloudy, calm or windy, and rainy or icy;
- (B) observe and record changes in the appearance of objects in the sky such as clouds, the Moon, and stars, including the Sun;
- (C) identify characteristics of the seasons of the year and day and night; and
- (D) demonstrate that air is all around us and observe that wind is moving air.

**112.13. Science, Grade 2**

**(b) Knowledge and skills.**

(7) Earth and space. The student knows that the natural world includes earth materials. The student is expected to:

- (A) observe and describe rocks by size, texture, and color;
- (B) identify and compare the properties of natural sources of freshwater and saltwater; and
- (C) distinguish between natural and manmade resources.

(8) Earth and space. The student knows that there are recognizable patterns in the natural world and among objects in the sky. The student is expected to:

- (A) measure, record, and graph weather information, including temperature, wind conditions, precipitation, and cloud coverage, in order to identify patterns in the data;
- (B) identify the importance of weather and seasonal information to make choices in clothing,

activities, and transportation;

(C) explore the processes in the water cycle, including evaporation, condensation, and precipitation, as connected to weather conditions; and

(D) observe, describe, and record patterns of objects in the sky, including the appearance of the Moon.

### **112.14. Science, Grade 3**

#### **(a) Introduction.**

(4) In Grade 3, students learn that the study of science uses appropriate tools and safe practices in planning and implementing investigations, asking and answering questions, collecting data by observing and measuring, and by using models to support scientific inquiry about the natural world.

(B) Students investigate how the surface of Earth changes and provides resources that humans use. As students explore objects in the sky, they describe how relationships affect patterns and cycles on Earth. Students will construct models to demonstrate Sun, Earth, and Moon system relationships and will describe the Sun's role in the water cycle.

#### **(b) Knowledge and skills.**

(7) Earth and space. The student knows that Earth consists of natural resources and its surface is constantly changing. The student is expected to:

(A) explore and record how soils are formed by weathering of rock and the decomposition of plant and animal remains;

(B) investigate rapid changes in Earth's surface such as volcanic eruptions, earthquakes, and landslides;

(C) identify and compare different landforms, including mountains, hills, valleys, and plains; and

(D) explore the characteristics of natural resources that make them useful in products and materials such as clothing and furniture and how resources may be conserved.

(8) Earth and space. The student knows there are recognizable patterns in the natural world and among objects in the sky. The student is expected to:

(A) observe, measure, record, and compare day-to-day weather changes in different locations at the same time that include air temperature, wind direction, and precipitation;

(B) describe and illustrate the Sun as a star composed of gases that provides light and heat energy for the water cycle;

(C) construct models that demonstrate the relationship of the Sun, Earth, and Moon, including orbits and positions; and

(D) identify the planets in Earth's solar system and their position in relation to the Sun.

### **112.15. Science, Grade 4**

#### **(a) Introduction**

(4) In Grade 4, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that 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. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(A) Within the natural environment, students know that earth materials have properties that are constantly changing due to Earth's forces. The students learn that the natural world consists of resources, including renewable and nonrenewable, and their responsibility to conserve our natural resources for future generations. They will also explore Sun, Earth, and Moon relationships. The students will recognize that our major source of energy is the Sun.

#### **(b) Knowledge and skills.**

- (3) Scientific investigation and reasoning. The student uses critical thinking and scientific problem solving to make informed decisions  
(C) represent the natural world using models such as rivers, stream tables, or fossils and identify their limitations, including accuracy and size
- (7) Earth and space. The students know that Earth consists of useful resources and its surface is constantly changing. The student is expected to:  
(A) examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants;  
(B) observe and identify slow changes to Earth's surface caused by weathering, erosion, and deposition from water, wind, and ice; and  
(C) identify and classify Earth's renewable resources, including air, plants, water, and animals; and nonrenewable resources, including coal, oil, and natural gas; and the importance of conservation.
- (8) Earth and space. The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:  
(A) measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key;  
(B) describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process; and  
(C) collect and analyze data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time.

## **112.16. Science, Grade 5**

### **Introduction**

1-3 remain the same as 4<sup>th</sup> grade.

(4) In Grade 5, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that 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. They have limitations and based on new discoveries are constantly being modified to more closely reflect the natural world.

(A) Within the physical environment, students learn about the physical properties of matter, including magnetism, physical states of matter, relative density, solubility in water, and the ability to conduct or insulate electrical and heat energy. Students explore the uses of light, thermal, electrical, and sound energies.

(B) Within the natural environment, students learn how changes occur on Earth's surface and that predictable patterns occur in the sky. Students learn that the natural world consists of resources, including nonrenewable, renewable, and alternative energy sources.

### **(b) Knowledge and skills.**

(7) Earth and space. The student knows Earth's surface is constantly changing and consists of useful resources. The student is expected to:

(A) explore the processes that led to the formation of sedimentary rocks and fossil fuels;

(B) recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice;

(C) identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels; and

(D) identify fossils as evidence of past living organisms and the nature of the environments at the time using models.

(8) Earth and space. The student knows that there are recognizable patterns in the natural world and

among the Sun, Earth, and Moon system. The student is expected to:

- (A) differentiate between weather and climate;
- (B) explain how the Sun and the ocean interact in the water cycle;
- (C) demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky; and
- (D) identify and compare the physical characteristics of the Sun, Earth, and Moon.

## **MIDDLE SCHOOL**

### **112.18. Science, Grade 6**

#### **(a) Introduction**

(4) The strands for Grade 6 include:

(B) Matter and energy.

(ii) Elements are classified as metals, nonmetals, and metalloids based on their physical properties. The elements are divided into three groups on the Periodic Table. Each different substance usually has a different density, so density can be used as an identifying property. Therefore, calculating density aids classification of substances.

(iii) Energy resources are available on a renewable, nonrenewable, or indefinite basis. Understanding the origins and uses of these resources enables informed decision making. Students should consider the ethical/social issues surrounding Earth's natural energy resources, while looking at the advantages and disadvantages of their long-term uses.

(C) Earth Science The focus of this strand is on introducing Earth's processes. Students should develop an understanding of Earth as part of our solar system. The topics include organization of our solar system, the role of gravity, and space exploration.

#### **(b) Knowledge and skills.**

(3) 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.

(B) use models to represent aspects of the natural world such as a model of Earth's layers;

(5) Matter and energy. The student knows the differences between elements and compounds

(B) recognize that a limited number of the many known elements comprise the largest portion of solid Earth, living matter, oceans, and the atmosphere;

(6) Matter and energy. The student knows matter has physical properties that can be used for classification

(A) compare metals, nonmetals, and metalloids using physical properties such as luster, conductivity, or malleability;

(C) test the physical properties of minerals, including hardness, color, luster, and streak.

(7) Matter and energy. The student knows that some of Earth's energy resources are available on a nearly perpetual basis, while others can be renewed over a relatively short period of time. Some energy resources, once depleted, are essentially nonrenewable. The student is expected to:

(A) research and debate the advantages and disadvantages of using coal, oil, natural gas, nuclear power, biomass, wind, hydropower, geothermal, and solar resources; and

(B) design a logical plan to manage energy resources in the home,

(10) Earth and space. The student understands the structure of Earth, the rock cycle, and plate tectonics. The student is expected to:

(A) build a model to illustrate the structural layers of Earth, including the inner core, outer core, mantle, crust, asthenosphere, and lithosphere;

(B) classify rocks as metamorphic, igneous, or sedimentary by the processes of their formation;

(C) identify the major tectonic plates, including Eurasian, African, Indo-Australian, Pacific, North American, and South American; and

(D) describe how plate tectonics causes major geological events such as ocean basins, earthquakes, volcanic eruptions, and mountain building.

(11) Earth and space. The student understands the organization of our solar system and the relationships among the various bodies that comprise it. The student is expected to:

(A) describe the physical properties, locations, and movements of the Sun, planets, Galilean moons, meteors, asteroids, and comets;

(B) understand that gravity is the force that governs the motion of our solar system; and

(C) describe the history and future of space exploration, including the types of equipment and transportation needed for space travel.school, or community

## **112.19. Science, Grade 7**

### **Introduction**

4) The strands for Grade 7 include

(D) Earth and space. Earth and space phenomena can be observed in a variety of settings. Both natural events and human activities can impact Earth systems. There are characteristics of Earth and relationships to objects in our solar system that allow life to exist.

### **(b) Knowledge and skills.**

8) Earth and space. The student knows that natural events and human activity can impact Earth systems. The student is expected to:

(A) predict and describe how different types of catastrophic events impact ecosystems such as floods, hurricanes, or tornadoes;

(B) analyze the effects of weathering, erosion, and deposition on the environment in ecoregions of Texas; and

(C) model the effects of human activity on groundwater and surface water in a watershed.

(9) Earth and space. The student knows components of our solar system. The student is expected to:

(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

(B) identify the accommodations, considering the characteristics of our solar system, that enabled manned space exploration

## **112.20. Science, Grade 8**

### **Introduction**

(4) The strands for Grade 8 include:

(C) Force, motion, and energy. Students experiment with the relationship between forces and motion through the study of Newton's three laws. Students learn how these forces relate to geologic processes and astronomical phenomena. In addition, students recognize that these laws are evident in everyday objects and activities. Mathematics is used to calculate speed using distance and time measurements.

(D) Earth and space. Students identify the role of natural events in altering Earth systems. Cycles within Sun, Earth, and Moon systems are studied as students learn about seasons, tides, and lunar phases. Students learn that stars and galaxies are part of the universe and that distances in space are measured by using light waves. In addition, students use data to research scientific theories of the origin of the universe. Students will illustrate how Earth features change over time by plate tectonics. They will interpret land and erosional features on topographic maps. Students learn how interactions in solar, weather, and ocean systems create changes in weather patterns and climate.

### **(b) Knowledge and skills.**

(6) Force, motion, and energy. The student knows that there is a relationship between force, motion,

and energy

(C) investigate and describe applications of Newton's law of inertia, law of force and acceleration, and law of action-reaction such as in vehicle restraints, sports activities, amusement park rides, Earth's tectonic activities, and rocket launches.

(7) Earth and space. The student knows the effects resulting from cyclical movements of the Sun, Earth, and Moon. The student is expected to:

(A) model and illustrate how the tilted Earth rotates on its axis, causing day and night, and revolves around the Sun causing changes in seasons;

(B) demonstrate and predict the sequence of events in the lunar cycle; and

(C) relate the position of the Moon and Sun to their effect on ocean tides.

(8) Earth and space. The student knows characteristics of the universe. The student is expected to:

(A) describe components of the universe, including stars, nebulae, and galaxies, and use models such as the Hertzsprung-Russell diagram for classification;

(B) 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;

(C) 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;

(D) model and describe how light years are used to measure distances and sizes in the universe; and

(E) research how scientific data are used as evidence to develop scientific theories to describe the origin of the universe.

(9) Earth and space. The student knows that natural events can impact Earth systems. The student is expected to:

(A) describe the historical development of evidence that supports plate tectonic theory;

(B) relate plate tectonics to the formation of crustal features; and

(C) interpret topographic maps and satellite views to identify land and erosional features and predict how these features may be reshaped by weathering.

(10) Earth and space. The student knows that climatic interactions exist among Earth, ocean, and weather systems. The student is expected to:

(A) recognize that the Sun provides the energy that drives convection within the atmosphere and oceans, producing winds and ocean currents;

(B) identify how global patterns of atmospheric movement influence local weather using weather maps that show high and low pressures and fronts; and

(C) identify the role of the oceans in the formation of weather systems such as hurricanes

This is a list of Earth Science TEKS only. TEKS for the other science courses can be found on the web

<http://ritter.tea.state.tx.us/rules/tac/chapter112/index.html>

These TEKS were initiated in 2010-2011. TEKS are presented in 2 sections introduction and knowledge and skills. The introduction is an overall view of the TEKS for that subject. The knowledge and skills are the topics that each student must master through the year.

Near the end of the year students will take a state wide test called the TAKS. The TAKS is in the process of being phased out and will be replaced by the STAAR.

Acronym dictionary

TEA-Texas Education Agency

TEKS-Texas Essential Knowledge and Skills

TAKS-Texas Assessment of Knowledge and Skills

STAAR-State of Texas Assessments of Academic Readiness