

## Alignment with Texas' Science Standards

This document evaluates the state's Education Standards for Science to determine alignment with content found in Cogno board games. Grades 3-8 were analyzed.



### Highlighting Key

Indicates a significant amount of material addresses the standard

Indicates a moderate amount of material is present to develop student understanding of the standard

### §112.5. Science, Grade 3.

(1) In Grade 3, the study of science includes ... making inferences, communicating conclusions, and making informed decisions.

(2). They observe the direction and position of objects as they are pushed and pulled, and movement of the Earth's surface as examples of change caused by a force. Students investigate magnetism and gravity. In addition, students explore organisms' needs, habitats, and competition with other organisms within their ecosystem.

(3) Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.

(5) 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.

(A) plan and implement descriptive investigations including asking well-defined questions, formulating testable hypotheses;

(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;

(D) communicate valid conclusions; and

(3) . The student knows that information, critical thinking, and scientific problem solving are used in making decisions.

(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;

(D) evaluate the impact of research on scientific thought, society, and the environment; and

(E) connect Grade 3 science concepts with the history of science and contributions of scientists.

(B) demonstrate that repeated investigations may increase the reliability of results.

(B) identify matter as liquids, solids, and gases.

(8). The student knows that living organisms need food, water, light, air, a way to dispose of waste, and an environment in which to live.

(A) observe and describe the habitats of organisms within an ecosystem;

(B) observe and identify organisms with similar needs that compete with one another for resources such as oxygen, water, food, or space;

(C) describe environmental changes in which some organisms would thrive, become ill, or perish; and

(D) describe how living organisms modify their physical environment to meet their needs such as beavers building a dam or humans building a home.

(9) The student knows that species have different adaptations that help them survive and reproduce in their environment.

(B) analyze how adaptive characteristics help individuals within a species to survive and reproduce.

(11) The student knows that the natural world includes earth materials and objects in the sky.

(C) identify the planets in our solar system and their position in relation to the Sun; and

(D) describe the characteristics of the Sun.

Source: The provisions of this §112.5 adopted to be effective September 1, 1998, 22 TexReg 7647.

#### **§112.6. Science, Grade 4.**

(1) In Grade 4, the study of science includes analyzing information, making informed decisions, and using tools such as compasses to collect information.

(2) the role of the Sun as our major source of energy. In addition, students identify the physical properties of matter .

(3) They learn that adaptations of organisms that lived in the past may have increased some species' ability to survive.

(4) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.

(6) 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.

(2) The student uses scientific inquiry methods during field and laboratory investigations.

(A) plan and implement descriptive investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;

(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;

(D) communicate valid conclusions; and

(3) The student uses critical thinking and scientific problem solving to make informed decisions.

(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;

(D) evaluate the impact of research on scientific thought, society, and the environment; and

(E) connect Grade 4 science concepts with the history of science and contributions of scientists.

(B) demonstrate that repeated investigations may increase the reliability of results.

(A) identify patterns of change such as in weather, metamorphosis, and objects in the sky;

(B) illustrate that certain characteristics of an object can remain constant even when the object is rotated like a spinning top, translated like a skater moving in a straight line, or reflected on a smooth surface; and

(7) The student knows that matter has physical properties.

(8) The student knows that adaptations may increase the survival of members of a species.

(A) identify characteristics that allow members within a species to survive and reproduce;

(B) compare adaptive characteristics of various species; and

(11) The student knows that the natural world includes earth materials and objects in the sky.

(B) summarize the effects of the oceans on land; and

(C) identify the Sun as the major source of energy for the Earth and understand its role in the growth of plants, in the creation of winds, and in the water cycle.

Source: The provisions of this §112.6 adopted to be effective September 1, 1998, 22 TexReg 7647.

### **§112.7. Science, Grade 5.**

(1) In Grade 5, the study of science includes analyzing information and making informed decisions.

(3) Students learn that adaptations can improve the survival of members of a species.

(4) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.

(A) plan and implement descriptive and simple experimental investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology;

(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;

(D) communicate valid conclusions; and

(3) The student uses critical thinking and scientific problem solving to make informed decisions.

(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;

(D) evaluate the impact of research on scientific thought, society, and the environment; and

(E) connect Grade 5 science concepts with the history of science and contributions of scientists.

(B) demonstrate that repeated investigations may increase the reliability of results.

(7) The student knows that matter has physical properties.

(A) differentiate among forms of energy including light, heat, electrical, and solar energy;

(B) identify and demonstrate everyday examples of how light is reflected, such as from tinted windows, and refracted, such as in cameras, telescopes, and eyeglasses;

(D) verify that vibrating an object can produce sound.

(9) The student knows that adaptations may increase the survival of members of a species.

(A) compare the adaptive characteristics of species that improve their ability to survive and reproduce in an ecosystem;

(C) identify the physical characteristics of the Earth and compare them to the physical characteristics of the moon; and

(D) identify gravity as the force that keeps planets in orbit around the Sun and the moon in orbit around the Earth.

### §112.22. Science, Grade 6.

(2) As students learn science skills, they identify components of the solar system including the Sun, planets, moon, and asteroids. In addition, students identify changes in objects including position, direction, and speed when acted upon by a force.

(4) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.

(6) 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.

(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;

(C) analyze and interpret information to construct reasonable explanations from direct and indirect evidence;

(D) communicate valid conclusions; and

(3) The student uses critical thinking and scientific problem solving to make informed decisions.

(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;

(D) evaluate the impact of research on scientific thought, society, and the environment; and

(E) connect Grade 6 science concepts with the history of science and contributions of scientists.

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

(A) identify and describe the changes in position, direction of motion, and speed of an object when acted upon by force;

(8) The student knows that complex interactions occur between matter and energy.

(B) identify cells as structures containing genetic material; and

(13) The student knows components of our solar system.

(A) identify characteristics of objects in our solar system including the Sun, planets, meteorites, comets, asteroids, and moons; and

(B) describe types of equipment and transportation needed for space travel.

Source: The provisions of this §112.22 adopted to be effective September 1, 1998, 22 TexReg 7647.

### **§112.23. Science, Grade 7.**

(1) In Grade 7, the study of science includes using scientific methods, critical-thinking, problem-solving.

(2) As students learn science skills, they identify gravity and phases of the moon as components of the solar system.

(3) Students learn about kinetic and potential energy and identify photosynthesis as an example of the transformation of radiant energy from the Sun into chemical energy for use by plants.

(4) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.

(6) 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.

(2) The student uses scientific inquiry methods during field and laboratory investigations.

(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;

(C) organize, analyze, make inferences, and predict trends from direct and indirect evidence;

(D) communicate valid conclusions; and

(3) The student uses critical thinking and scientific problem solving to make informed decisions.

(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;

(D) evaluate the impact of research on scientific thought, society, and the environment; and

(F) connect Grade 7 science concepts with the history of science and contributions of scientists.

(4) The student knows how to use tools and methods to conduct science inquiry.

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

(A) demonstrate basic relationships between force and motion using simple machines including pulleys and levers;

(B) demonstrate that an object will remain at rest or move at a constant speed and in a straight line if it is not being subjected to an unbalanced force; and

(8) The student knows that complex interactions occur between matter and energy.

(A) illustrate examples of potential and kinetic energy in everyday life such as objects at rest, movement of geologic faults, and falling water; and

(B) identify that radiant energy from the Sun is transferred into chemical energy through the process of photosynthesis.

(C) describe how different environments support different varieties of organisms; and

(13) The student knows components of our solar system.

Source: The provisions of this §112.23 adopted to be effective September 1, 1998, 22 TexReg 7647.

**§112.24. Science, Grade 8.**

(1) In Grade 8, the study of science includes using scientific methods, analyzing data, critical-thinking, scientific problem-solving.

(2) Students learn that stars and galaxies are part of the universe, identify light years as a way to describe distance, and learn about scientific theories of the origin of the universe.

(3) Interactions in matter and energy are explored in solar, weather, and ocean systems. Students identify the origin of waves and investigate their ability to travel through different media.

(5) Science is a way of learning about the natural world. Students should know how science has built a vast body of changing and increasing knowledge described by physical, mathematical, and conceptual models, and also should know that science may not answer all questions.

(7) 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.

(2) The student uses scientific inquiry methods during field and laboratory investigations.

(A) plan and implement investigative procedures including asking questions, formulating testable hypotheses, and selecting and using equipment and technology;

(C) organize, analyze, evaluate, make inferences, and predict trends from direct and indirect evidence;

(D) communicate valid conclusions; and

(3) The student uses critical thinking and scientific problem solving to make informed decisions.

(A) analyze, review, and critique scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information;

(D) evaluate the impact of research on scientific thought, society, and the environment; and

(E) connect Grade 8 science concepts with the history of science and contributions of scientists.

(B) extrapolate from collected information to make predictions.

(7) The student knows that there is a relationship between force and motion.

(A) demonstrate how unbalanced forces cause changes in the speed or direction of an object's motion; and

(B) recognize that waves are generated and can travel through different media.

(8) The student knows that matter is composed of atoms.

(10) The student knows that complex interactions occur between matter and energy.

(B) describe interactions among solar, weather, and ocean systems; and

(13) The student knows characteristics of the universe.

(A) describe characteristics of the universe such as stars and galaxies;

(B) explain the use of light years to describe distances in the universe; and

(C) research and describe historical scientific theories of the origin of the universe.

Please note that use of these standards does not imply this state's endorsement of Cogno.