

Alignment with Georgia's 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

THIRD GRADE

Habits of Mind

S3CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

b. Offer reasons for findings and consider reasons suggested by others.

S3CS2. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.

a. Add, subtract, multiply, and divide whole numbers mentally, on paper, and with a calculator.

c. Judge whether measurements and computations of quantities, such as length, weight, or time, are reasonable answers to scientific problems by comparing them to typical values.

S3CS5. Students will communicate scientific ideas and activities clearly.

c. Use numerical data in describing and comparing objects and events.

S3CS6. Students will question scientific claims and arguments effectively.

a. Support statements with facts found in books, articles, and databases, and identify the sources used.

The Nature of Science

S3CS7. Students will be familiar with the character of scientific knowledge and how it is achieved.

Students will recognize that:

b. Some scientific knowledge is very old and yet is still applicable today.

S3CS8. Students will understand important features of the process of scientific inquiry.

- c. Scientists use technology to increase their power to observe things and to measure and compare things accurately.
- d. Science involves many different kinds of work and engages men and women of all ages and backgrounds.

Physical Science

S3P1. Students will investigate how heat is produced and the effects of heating and cooling, and will understand a change in temperature indicates a change in heat.

- c. Investigate the transfer of heat energy from the sun to various materials.

Life Science

S3L1. Students will investigate the habitats of different organisms and the dependence of organisms on their habitat.

- d. Explain what will happen to an organism if the habitat is changed.

FOURTH GRADE

Habits of the Mind

S4CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

- b. Carefully distinguish observations from ideas and speculation about those observations.
- c. Offer reasons for findings and consider reasons suggested by others.

S4CS2. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.

- a. Add, subtract, multiply, and divide whole numbers mentally, on paper, and with a calculator.
- c. Judge whether measurements and computations of quantities, such as length, area, volume, weight, or time, are reasonable answers to scientific problems by comparing them to typical values.

S4CS6. Students will question scientific claims and arguments effectively.

- a. Support statements with facts found in books, articles, and databases, and identify the sources used.
- b. Identify when comparisons might not be fair because some conditions are different.

The Nature of Science

S4CS7. Students will be familiar with the character of scientific knowledge and how it is achieved.

Students will recognize that:

- b. Some scientific knowledge is very old and yet is still applicable today.

S4CS8. Students will understand important features of the process of scientific inquiry.

- c. Scientists use technology to increase their power to observe things and to measure and

- compare things accurately.
- d. Science involves many different kinds of work and engages men and women of all ages and backgrounds.

Earth Science

S4E1. Students will compare and contrast the physical attributes of stars, star patterns, and planets.

- a. Recognize the physical attributes of stars in the night sky such as number, size, color and patterns.
- b. Compare the similarities and differences of planets to the stars in appearance, position, and number in the night sky.
- c. Explain why the pattern of stars in a constellation stays the same, but a planet can be seen in different locations at different times.
- d. Identify how technology is used to observe distant objects in the sky.

S4E2. Students will model the position and motion of the earth in the solar system and will explain the role of relative position and motion in determining sequence of the phases of the moon.

- a. Explain the day/night cycle of the earth using a model.
- b. Explain the sequence of the phases of the moon.
- c. Demonstrate the revolution of the earth around the sun and the earth's tilt to explain the seasonal changes.
- d. Demonstrate the relative size and order from the sun of the planets in the solar system.

S4E3. Students will differentiate between the states of water and how they relate to the water cycle and weather.

- a. Demonstrate how water changes states from solid (ice) to liquid (water) to gas (water vapor/steam) and changes from gas to liquid to solid.

Physical Science

S4P1. Students will investigate the nature of light using tools such as mirrors, lenses, and prisms.

- a. Identify materials that are transparent, opaque, and translucent.
- b. Investigate the reflection of light using a mirror and a light source.

S4P2. Students will demonstrate how sound is produced by vibrating objects and how sound can be varied by changing the rate of vibration.

- a. Investigate how sound is produced.

S4P3. Students will demonstrate the relationship between the application of a force and the resulting change in position and motion on an object.

- b. Using different size objects, observe how force affects speed and motion.
- c. Explain what happens to the speed or direction of an object when a greater force than the initial one is applied.
- d. Demonstrate the effect of gravitational force on the motion of an object.

Life Science

S4L1. Students will describe the roles of organisms and the flow of energy within an ecosystem.

- b. Demonstrate the flow of energy through a food web/food chain beginning with sunlight and including producers, consumers, and decomposers.

S4L2. Students will identify factors that affect the survival or extinction of organisms such as adaptation, variation of behaviors (hibernation), and external features (camouflage and protection).

- a. Identify external features of organisms that allow them to survive or reproduce better than organisms that do not have these features (for example: camouflage, use of hibernation, protection, etc.).

FIFTH GRADE

Habits of the Mind

S5CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

- b. Carefully distinguish observations from ideas and speculation about those observations.
- c. Offer reasons for findings and consider reasons suggested by others.

S5CS2. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.

- a. Add, subtract, multiply, and divide whole numbers mentally, on paper, and with a calculator.
- c. Judge whether measurements and computations of quantities, such as length, area, volume, weight, or time, are reasonable answers to scientific problems by comparing them to typical values.

S5CS6. Students will question scientific claims and arguments effectively.

- a. Support statements with facts found in books, articles, and databases, and identify the sources used.
- b. Identify when comparisons might not be fair because some conditions are different.

The Nature of Science

S5CS7. Students will be familiar with the character of scientific knowledge and how it is achieved.

- b. Some scientific knowledge is very old and yet is still applicable today.

S5CS8. Students will understand important features of the process of scientific inquiry.

- c. Scientists use technology to increase their power to observe things and to measure and compare things accurately.
- d. Science involves many different kinds of work and engages men and women of all ages and backgrounds.

Earth Science

S5E1. Students will identify surface features of the Earth caused by constructive and destructive processes.

- a. Identify surface features caused by constructive processes.
 - Volcanoes
- b. Identify and find examples of surface features caused by destructive processes.

- Erosion (water—rivers and oceans, wind)
- Weathering

Physical Science

S5P1. Students will verify that an object is the sum of its parts.

- Demonstrate that the mass of an object is equal to the sum of its parts by manipulating and measuring different objects made of various parts.
- Investigate how common items have parts that are too small to be seen without magnification.

S5P2. Students will explain the difference between a physical change and a chemical change.

- Recognize that the changes in state of water (water vapor/steam, liquid, ice) are due to temperature differences and are examples of physical change.

S5P3. Students will investigate the electricity, magnetism, and their relationship.

- Investigate static electricity.

Life Science

S5L2. Students will recognize that offspring can resemble parents in inherited traits and learned behaviors.

- Compare and contrast the characteristics of learned behaviors and of inherited traits.

S5L4. Students will relate how microorganisms benefit or harm larger organisms.

- Identify beneficial microorganisms and explain why they are beneficial.
- Identify harmful microorganisms and explain why they are harmful.

SIXTH GRADE

Characteristics of Science Habits of Mind

S6CS1. Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

S6CS3. Students will use computation and estimation skills necessary for analyzing data and following scientific explanations.

- Draw conclusions based on analyzed data.

S6CS5. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.

- Observe and explain how parts are related to other parts in systems such as weather systems, solar systems, and ocean systems including how the output from one part of a system (in the form of material, energy, or information) can become the input to other parts. (For example: El Nino's effect on weather)
- Identify several different models (such as physical replicas, pictures, and analogies) that could be used to represent the same thing, and evaluate their usefulness, taking into account such things as the model's purpose and complexity.

The Nature of Science

S6CS8. Students will investigate the characteristics of scientific knowledge and how it is achieved.

Students will apply the following to scientific concepts:

- a. When similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, which often requires further study. Even with similar results, scientists may wait until an investigation has been repeated many times before accepting the results as meaningful.
- b. When new experimental results are inconsistent with an existing, well-established theory, scientists may require further experimentation to decide whether the results are flawed or the theory requires modification.
- c. As prevailing theories are challenged by new information, scientific knowledge may change and grow.

S6CS9. Students will investigate the features of the process of scientific inquiry.

- a. Accurate record keeping, data sharing, and replication of results are essential for maintaining an investigator's credibility with other scientists and society.
- b. Scientists use technology and mathematics to enhance the process of scientific inquiry.

S6CS10. Students will enhance reading in all curriculum areas by:

- Read both informational and fictional texts in a variety of genres and modes of discourse
- Read technical texts related to various subject areas
- Discuss messages and themes from books in all subject areas.
- Respond to a variety of texts in multiple modes of discourse.
- Explore understanding of new words found in subject area texts.
- Explore life experiences related to subject area content.

Co-Requisite-Content

S6E1. Students will explore current scientific views of the universe and how those views evolved.

- a. Relate the Nature of Science to the progression of basic historical scientific models (geocentric, heliocentric) as they describe our solar system, and the Big Bang as it describes the formation of the universe.
- b. Describe the position of the solar system in the Milky Way galaxy and the universe.
- c. Compare and contrast the planets in terms of
 - Size relative to the earth
 - Surface and atmospheric features
 - Relative distance from the sun
 - Ability to support life
- d. Explain the motion of objects in the day/night sky in terms of relative position.
- e. Explain that gravity is the force that governs the motion in the solar system.
- f. Describe the characteristics of comets, asteroids, and meteors.

S6E2. Students will understand the effects of the relative positions of the earth, moon and sun.

- a. Demonstrate the phases of the moon by showing the alignment of the earth, moon, and sun.
- b. Relate the tilt of the earth to the distribution of sunlight throughout the year and its effect on climate.

S6E3. Students will recognize the significant role of water in earth processes.

- a. Describe the composition, location, and subsurface topography of the world's oceans.
- b. Explain the causes of waves, currents, and tides.

S6E5. Students will investigate the scientific view of how the earth's surface is formed.

- a. Compare and contrast the Earth's crust, mantle, and core including temperature, density, and composition.
- b. Recognize that lithospheric plates constantly move and cause major geological events on the earth's surface.

S6E6. Students will describe various sources of energy and with their uses and conservation.

- a. Explain the role of the sun as the major source of energy and its relationship to wind and water energy.

SEVENTH GRADE

Characteristics of Science

Habits of Mind

S7CS1. Students will explore of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

- a. Understand the importance of—and keep—honest, clear, and accurate records in science.
- b. Understand that hypotheses can be valuable, even if they turn out not to be completely accurate.

S7CS3. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.

- d. Draw conclusions based on analyzed data.

S7CS3. Students will have the computation and estimation skills necessary for analyzing data and following scientific explanations.

- d. Draw conclusions based on analyzed data.

The Nature of Science

S7CS8. Students will investigate the characteristics of scientific knowledge and how that knowledge is achieved.

- b. When new experimental results are inconsistent with an existing, well-established theory, scientists may pursue further experimentation to determine whether the results are flawed or the theory requires modification.
- c. As prevailing theories are challenged by new information, scientific knowledge may change.

S7CS9. Students will investigate the features of the process of scientific inquiry.

- a. Investigations are conducted for different reasons, which include exploring new phenomena, confirming previous results, testing how well a theory predicts, and comparing competing theories.
- b. Scientific investigations usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations to make sense of collected evidence.
- e. Accurate record keeping, data sharing, and replication of results are essential for maintaining an investigator's credibility with other scientists and society.
- f. Scientists use technology and mathematics to enhance the process of scientific inquiry.

S7CS10. Students will enhance reading in all curriculum areas by:

- Read both informational and fictional texts in a variety of genres and modes of

discourse

- Read technical texts related to various subject areas
- Discuss messages and themes from books in all subject areas.
- Respond to a variety of texts in multiple modes of discourse.
- Explore understanding of new words found in subject area texts.
- Explore life experiences related to subject area content.

EIGHTH GRADE

Characteristics of Science

Habits of Mind

S8CS1. Students will explore the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

- a. Understand the importance of—and keep—honest, clear, and accurate records in science.

The Nature of Science

S8CS8. Students will be familiar with the characteristics of scientific knowledge and how it is achieved.

Students will apply the following to scientific concepts:

- a. When similar investigations give different results, the scientific challenge is to judge whether the differences are trivial or significant, which often requires further study. Even with similar results, scientists may wait until an investigation has been repeated many times before accepting the results as meaningful.
- b. When new experimental results are inconsistent with an existing, well-established theory, scientists may pursue further experimentation to determine whether the results are flawed or the theory requires modification.
- c. As prevailing theories are challenged by new information, scientific knowledge may change.

S8CS9. Students will understand the features of the process of scientific inquiry.

- a. Investigations are conducted for different reasons, which include exploring new phenomena, confirming previous results, testing how well a theory predicts, and comparing different theories.
- b. Scientific investigations usually involve collecting evidence, reasoning, devising hypotheses, and formulating explanations to make sense of collected evidence.
- e. Accurate record keeping, data sharing, and replication of results are essential for maintaining an investigator's credibility with other scientists and society.
- f. Scientists use technology and mathematics to enhance the process of scientific inquiry.

S8CS10. Students will enhance reading in all curriculum areas by:

- a. Read both informational and fictional texts in a variety of genres and modes of discourse.
- a. Read technical texts related to various subject areas.
- b. Discussing books
 - a. Discuss messages and themes from books in all subject areas.
 - a. Respond to a variety of texts in multiple modes of discourse.
 - a. Use content vocabulary in writing and speaking.

- Explore understanding of new words found in subject area texts.

Co-Requisite – Content

S8P1. Students will examine the scientific view of the nature of matter.

- c. Describe the movement of particles in solids, liquids, gases, and plasmas states.
- g. Identify and demonstrate the Law of Conservation of Matter.

S8P2. Students will be familiar with the forms and transformations of energy.

- a. Explain energy transformation in terms of the Law of Conservation of Energy.
- b. Explain the relationship between potential and kinetic energy.
- c. Compare and contrast the different forms of energy (heat, light, electricity, mechanical motion, sound) and their characteristics.

S8P3. Students will investigate relationship between force, mass, and the motion of objects.

- a. Determine the relationship between velocity and acceleration.
- b. Demonstrate the effect of balanced and unbalanced forces on an object in terms of gravity, inertia, and friction.

S8P4. Students will explore the wave nature of sound and electromagnetic radiation.

- a. Describe how the behavior of light waves is manipulated causing reflection, refraction diffraction, and absorption.
- b. Explain how the human eye sees objects and colors in terms of wavelengths.
- c. Relate the properties of sound to everyday experiences.

S8P5. Students will recognize characteristics of gravity, electricity, and magnetism as major kinds of forces acting in nature.

- a. Recognize that every object exerts gravitational force on every other object and that the force exerted depends on how much mass the objects have and how far apart they are.

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