

Alignment with Pennsylvania'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

Unifying Themes

3.1.4. GRADE 4

- A. Know that scale is an important attribute of natural and human made objects, events and phenomena.
- Identify the use of scale as it relates to the measurement of distance, volume and mass.
 - Describe scale as a ratio (e.g., map scales).
- B. Recognize change in natural and physical systems.
- Describe relative motion.
 - Describe the change to objects caused by heat, cold, light or chemicals.

3.1.7. GRADE 7

- A. Explain scale as a way of relating concepts and ideas to one another by some measure.
- Apply various applications of size and dimensions of scale to scientific, mathematical, and technological applications.
 - Describe scale as a form of ratio and apply to a life situation.
- B. Identify change as a variable in describing natural and physical systems.
- Describe fundamental science and technology concepts that could solve practical problems.
 - Describe the effect of making a change in one part of a system on the system as a whole.

3.2. Inquiry and Design

3.2.4. GRADE 4

- A. Identify and use the nature of scientific and technological knowledge.
- Distinguish between a scientific fact and a belief.
 - Provide clear explanations that account for observations and results.
 - Relate how new information can change existing perceptions.
- B. Recognize and use the elements of scientific inquiry to solve problems.
- Generate questions about objects, organisms and/or events that can be answered through scientific investigations.

3.2.7. GRADE 7

- A. Explain and apply scientific and technological knowledge.

- Distinguish between a scientific theory and a belief.
- Answer “What if” questions based on observation, inference or prior knowledge or experience.
- Explain how skepticism about an accepted scientific explanation led to a new understanding.
- Explain how new information may change existing theories and practice.

B. Apply process knowledge to make and interpret observations.

- Describe relationships by making inferences and predictions.
- Communicate, use space / time relationships, define operationally, raise questions, formulate hypotheses, test and experiment,
- Interpret data, formulate models, design models, and produce solutions.

C. Identify and use the elements of scientific inquiry to solve problems.

- Generate questions about objects, organisms and/or events that can be answered through scientific investigations.
- Evaluate the appropriateness of questions.
- Communicate appropriate conclusions from the experiment.

3.3. Biological Sciences

3.3.4. GRADE 4

A. Know the similarities and differences of living things.

- Identify life processes of living things (e.g., growth, digestion, react to environment).
- Know that some organisms have similar external characteristics (e.g., anatomical characteristics; appendages, type of covering, body segments) and that similarities and differences are related to environmental habitat.
- Describe basic needs of plants and animals.

3.3.7. GRADE 7

A. Describe the similarities and differences that characterize diverse living things.

- Describe how the structures of living things help them function in unique ways.
- Explain how to use a dichotomous key to identify plants and animals.
- Account for adaptations among organisms that live in a particular environment.

D. Explain basic concepts of natural selection.

- Identify adaptations that allow organisms to survive in their environment.
- Describe how an environmental change can affect the survival of organisms and entire species.

3.4. Physical Science, Chemistry, and Physics

3.4.4. GRADE 4

B. Know basic energy types, sources and conversions.

- Identify energy forms and examples (e.g., sunlight, heat, stored, motion).
- Know the characteristics of light (e.g., reflection, refraction, absorption) and use them to produce heat, color or a virtual image.

C. Observe and describe different types of force and motion.

- Identify characteristics of sound (pitch, loudness and echoes)
- Recognize forces that attract or repel other objects and demonstrate them.
- Describe various types of motions.
- Compare the relative movement of objects and describe types of motion that are evident.
- Describe the position of an object by locating it relative to another object or the background (e.g., geographic direction, left, up).

D. Describe the composition and structure of the universe and the earth’s place in it.

- Recognize earth’s place in the solar system.
- Identify planets in our solar system and their general characteristics.

3.4.7. GRADE 7

B. Relate energy sources and transfers to heat and temperature.

- Identify and describe sound changes in moving objects.
- Know that the sun is a major source of energy that emits wavelengths of visible light, infrared and ultraviolet radiation.

C. Identify and explain the principles of force and motion.

- Describe the motion of an object based on its position, direction and speed.
- Explain how convex and concave mirrors and lens change light images.
- Explain how sound and light travel in waves of differing speeds, sizes and frequencies.

D. Describe essential ideas about the composition and structure of the universe and the earth's place in it.

- Compare various planets' characteristics.
- Describe basic star types and identify the sun as a star type.
- Describe and differentiate comets, asteroids and meteors.
- Identify gravity as the force that keeps planets in orbit around the sun and governs the rest of the movement of the solar system and the universe.
- Identify equipment and instruments that explore the universe.
- Identify the accomplishments and contributions provided by selected past and present scientists in the field of astronomy.
- Identify and articulate space program efforts to investigate possibilities of living in space and on other planets.

3.5. Earth Sciences

3.5.4. GRADE 4

D. Recognize the earth's different water resources.

- Know that approximately three-fourths of the earth is covered by water.
- Identify examples of water in the form of solid, liquid and gas on or near the surface of the earth.

3.5.7. GRADE 7

A. Describe earth features and processes.

- Describe major layers of the earth.
- Describe the processes involved in the creation of geologic features (e.g., folding, faulting, volcanism, sedimentation) and that these processes seen today (e.g., erosion, weathering, crustal plate movement) are similar to those in the past.

3.8. Science, Technology, and Human Endeavors

3.8.4. Grade 4

A. Know that people select, create and use science and technology and that they are limited by social and physical restraints.

- Identify and describe positive and negative impacts that influence or result from new tools and techniques.
- Describe how scientific discoveries and technological advancements are related.

B. Know how human ingenuity and technological resources satisfy specific human needs and improve the quality of life.

- Describe a technological invention and the resources that were used to develop it.

C. Know the pros and cons of possible solutions to scientific and technological problems in society.

- Compare the positive and negative expected and unexpected impacts of technological change.
- Identify and discuss examples of technological change in the community that have both positive and negative impacts.

3.8.7. Grade 7

A. Explain how sciences and technologies are limited in their effects and influences on society.

- Identify and describe the unavoidable constraints of technological design.
 - Identify changes in society as a result of a technological development.
 - Identify and explain improvements in transportation, health, sanitation and communications as a result of advancements in science and technology and how they affect our lives.
- B. Explain how human ingenuity and technological resources satisfy specific human needs and improve the quality of life.
- Identify interrelationships between systems and resources.
 - Identify and describe the resources necessary to solve a selected problem in a community and improve the quality of life.
- C. Identify the pros and cons of applying technological and scientific solutions to address problems and the effect upon society.
- Describe the positive and negative expected and unexpected effects of specific technological developments.
 - Describe ways technology extends and enhances human abilities.

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