

Alignment with Montana'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

Content Standard 1—Students, through the inquiry process, demonstrate the ability to design, conduct, evaluate, and communicate results and reasonable conclusions of scientific investigations.

End of Grade 4

1. develop the abilities necessary to safely conduct scientific inquiry, including (a step-by-step sequence is not implied): (a) asking questions about objects, events, and organisms in the environment, (b) planning and conducting simple investigations
2. select and use appropriate tools including technology to make measurements (including metric units) and represent results of basic scientific investigations
3. use data to describe and communicate the results of scientific investigations
4. use models that illustrate simple concepts and compare those models to the actual phenomenon

End of Grade 8

1. identify a question, determine relevant variables and a control, formulate a testable hypothesis, plan and predict the outcome of an investigation, safely conduct scientific investigation, and compare and analyze data
2. select and use appropriate tools including technology to make measurements (in metric units), gather, process and analyze data from scientific investigations
3. review, communicate and defend results of investigations, including considering alternative explanations
4. create models to illustrate scientific concepts and use the model to predict change. (e.g., computer simulation, stream table, graphic representation)
5. identify strengths and weakness in an investigation design

Content Standard 2—Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems.

Grade 4

3. identify the basic characteristics of light, heat, motion, magnetism, electricity and sound
4. model and explain that matter exists as solids, liquids, and gases and can change from one form to another
5. identify that the position of an object can be described by its location relative to another object and

its motions described, and measured by external forces action upon it

Grade 8

3. describe energy and compare and contrast the energy transformations and the characteristics of light, heat, motion, magnetism, electricity, sound and mechanical waves

4. model and explain the states of matter are dependent upon the quantity of energy present in the system and describe what will change and what will remain unchanged at the particulate level when matter experiences an external force or energy change

5. describe and explain the motion of an object in terms of its position, direction, & speed as well as the forces acting upon it

Content Standard 3—Students, through the inquiry process, demonstrate knowledge of characteristics, structures and function of living things, the process and diversity of life, and how living organisms interact with each other and their environment.

Grade Four

2. identify, measure, and describe basic requirements of energy and nutritional needs for an organism.

5. create and use a classification system to group a variety of plants and animals according to their similarities and differences

Grade Eight

4. investigate and explain the interdependent nature of populations and communities in the environment and describe how species in these populations adapt by evolving

5. create and use a basic classification scheme to identify plants and animals

Content Standard 4—Students, through the inquiry process, demonstrate knowledge of the composition, structures, processes and interactions of Earth's systems and other objects in space.

Grade Four

1. describe and give examples of earth's changing features

6. identify objects (e.g., moon, stars, meteors) in the sky and their patterns of movement and explain that light and heat comes from a star called the sun

7. identify technology and methods used for space exploration (e.g. star parties, space shuttles, telescopes)

Grade Eight

5. describe and model the motion and tilt of earth in relation to the sun, and explain the concepts of day, night, seasons, year, and climatic changes

6. describe the earth, moon, planets and other objects in space in terms of size, force of gravity, structure, and movement in relation to the sun.

7. identify scientific theories about the origin and evolution of the earth and solar system

Content Standard 5—Students, through the inquiry process, understand how scientific knowledge and technological developments impact communities, cultures and societies.

Grade Four

1. describe and discuss examples of how people use science and technology

2. describe a scientific or technological innovation that impacts communities, cultures, and societies

3. simulate scientific collaboration by sharing and communicating ideas to identify and describe problems

4. use scientific knowledge to make inferences and propose solutions for simple environmental

problems

Grade Eight

1. describe the specific fields of science and technology as they relate to occupations within those fields
2. apply scientific knowledge and process skills to understand issues and everyday events
3. simulate collaborative problem solving and give examples of how scientific knowledge and technology are shared with other scientists and the public
4. use scientific knowledge to investigate problems and their proposed solutions and evaluate those solutions while considering environmental impacts

Content Standard 6—Students understand historical developments in science and technology.

Grade Four

1. give historical examples of scientific and technological contributions to communities, cultures and societies, including Montana American Indian examples
2. identify major milestones in science that have impacted science, technology, and society
3. describe science as a human endeavor and an ongoing process

Grade Eight

1. give examples of scientific discoveries and describe the interrelationship between technological advances and scientific understanding, including Montana American Indian examples
2. identify major milestones in science that have impacted science, technology, and society
3. describe and explain science as a human endeavor and an ongoing process

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