

Alignment with Michigan'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

GLCE Code	Expectation
Science Processes	Inquiry Process
Statement S.IP.E.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.
S.IP.03.12	Generate questions based on observations.
S.IP.03.13	Plan and conduct simple and fair investigations.
S.IP.03.15	Make accurate measurements with appropriate units (centimeters, meters, Celsius, grams, seconds, minutes) for the measurement tool.
Science Processes	Inquiry Analysis and Communication
Statement S.IA.E.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.
S.IA.03.12	Share ideas about science through purposeful conversation in collaborative groups.
S.IA.03.13	Communicate and present findings of observations and investigations.
S.IA.03.14	Develop research strategies and skills for information gathering and problem solving.
S.IA.03.15	Compare and contrast sets of data from multiple trials of a science investigation to explain reasons for differences.

GLCE Code	Expectation
Science Processes	Reflection and Social Implications
Statement S.RS.E.1	Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision making and the application of science throughout history and within society.
S.RS.03.11	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.
S.RS.03.14	Use data/samples as evidence to separate fact from opinion.
S.RS.03.15	Use evidence when communicating scientific ideas.
S.RS.03.16	Identify technology used in everyday life.
S.RS.03.17	Identify current problems that may be solved through the use of technology.
S.RS.03.19	Describe how people have contributed to science throughout history and across cultures.
Physical Science	Force and Motion
Statement P.FM.E.2	Gravity- Earth pulls down on all objects with a force called gravity. With very few exceptions, objects fall to the ground no matter where the object is on the Earth.
P.FM.03.22	Identify the force that pulls objects towards the Earth.
Statement P.FM.E.3	Force- A force is either a push or a pull. The motion of objects can be changed by forces. The size of the change is related to the size of the force. The change is also related to the weight (mass) of the object on which the force is being exerted. When an object does not move in response to a force, it is because another force is being applied by the environment.
P.FM.03.35	Describe how a push or a pull is a force.
P.FM.03.36	Relate a change in motion of an object to the force that caused the change of motion.
P.FM.03.37	Demonstrate how the change in motion of an object is related to the strength of the force acting upon the object and to the mass of the object.
P.FM.03.38	Demonstrate when an object does not move in response to a force, it is because another force is acting on it.
Statement P.FM.E.4	Speed- An object is in motion when its position is changing. The speed of an object is defined by how far it travels divided by the amount of time it took to travel that far.
P.FM.03.41	Compare and contrast the motion of objects in terms of direction.
P.FM.03.42	Identify changes in motion (change direction, speeding up, slowing down).
P.FM.03.43	Calculate the speed of an object based on the distance it travels divided by the amount of time it took to travel that distance.

GLCE Code	Expectation
Physical Science	Energy
Statement P.EN.E.1	Forms of Energy- Heat, electricity, light, and sound are forms of energy.
P.EN.03.11	Identify light and sound as forms of energy.
Statement P.EN.E.2	Light Properties- Light travels in straight lines. Shadows result from light not being able to pass through an object. When light travels at an angle from one substance to another (air and water), it changes direction.
P.EN.03.21	Demonstrate that light travels in a straight line and that shadows are made by placing an object in a path of light.
P.EN.03.22	Demonstrate what happens to light when it travels from water to air (straw half in water looks bent).
Statement P.EN.E.3	Sound- Vibrating objects produce sound. The pitch of sound varies by changing the rate of vibration.
P.EN.03.31	Relate sounds to their sources of vibrations (for example: a musical note produced by a vibrating guitar string, the sounds of a drum made by the vibrating drum head).
Physical Science	Properties of Matter
Statement P.PM.E.5	Conductive and Reflective Properties- Objects vary to the extent they absorb and reflect light energy and conduct heat and electricity.
P.PM.03.51	Demonstrate how some materials are heated more than others by light that shines on them.
P.PM.03.52	Explain how we need light to see objects: light from a source reflects off objects and enters our eyes.
Life Science	Organization of Living Things
Statement L.OLE.3	Structures and Functions- Organisms have different structures that serve different functions in growth, survival, and reproduction.
Life Science	Evolution
Statement L.EV.E.1	Environmental Adaptation- Different kinds of organisms have characteristics that help them to live in different environments.
L.EV.03.11	Relate characteristics and functions of observable parts in a variety of plants that allow them to live in their environment (for example: leaf shape, thorns, odor, color).
L.EV.03.12	Relate characteristics and functions of observable body parts to the ability of animals to live in their environment (for example: sharp teeth, claws, color, body covers).
Earth Science	Solid Earth
Statement E.SE.E.2	Surface Changes- The surface of Earth changes. Some changes are due to slow processes, such as erosion and weathering, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.

GLCE Code	Expectation
E.SE.03.22	Identify and describe natural causes of change in the Earth's surface (erosion, glaciers, volcanoes, landslides, and earthquakes).

Fourth Grade

GLCE Code	Expectation
Science Processes	Inquiry Process
Statement S.IP.E.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.
S.IP.04.11	Make purposeful observation of the natural world using the appropriate senses.
S.IP.04.12	Generate questions based on observations.
S.IP.04.13	Plan and conduct simple and fair investigations.
S.IP.04.15	Make accurate measurements with appropriate units (centimeters, meters, Celsius, grams, seconds, minutes) for the measurement tool.
Science Processes	Inquiry Analysis and Communication
Statement S.IA.E.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.
S.IA.04.11	Summarize information from charts and graphs to answer scientific questions.
S.IA.04.12	Share ideas about science through purposeful conversation in collaborative groups.
S.IA.04.13	Communicate and present findings of observations and investigations.
S.IA.04.14	Develop research strategies and skills for information gathering and problem solving.
S.IA.04.15	Compare and contrast sets of data from multiple trials of a science investigation to explain reasons for differences.
Science Processes	Reflection and Social Implications
Statement S.RS.E.1	Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision making and the application of science throughout history and within society.
S.RS.04.11	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.
S.RS.04.14	Use data/samples as evidence to separate fact from opinion.
S.RS.04.15	Use evidence when communicating scientific ideas.

GLCE Code	Expectation
S.RS.04.16	Identify technology used in everyday life.
S.RS.04.17	Identify current problems that may be solved through the use of technology.
S.RS.04.19	Describe how people have contributed to science throughout history and across cultures.
Physical Science	Properties of Matter
Statement P.PM.E.1	Physical Properties- All objects and substances have physical properties that can be measured.
P.PM.04.16	Measure the weight (spring scale) and mass (balances in grams or kilograms) of objects.
P.PM.04.17	Measure volumes of liquids and capacities of containers in milliliters and liters.
Statement P.PM.E.2	States of Matter- Matter exists in several different states: solids, liquids, and gases. Each state of matter has unique physical properties. Gases are easily compressed, but liquids and solids do not compress easily. Solids have their own particular shapes, but liquids and gases take the shape of the container.
P.PM.04.23	Compare and contrast the states (solids, liquids, gases) of matter.
Statement P.PM.E.3	Magnets- Magnets can repel or attract other magnets. Magnets can also attract certain non-magnetic objects at a distance.
Life Science	Organization of Living Things
Statement L.OLE.1	Life Requirements- Organisms have basic needs. Animals and plants need air, water, and food. Plants also require light. Plants and animals use food as a source of energy and as a source of building material for growth and repair.
L.OL.04.15	Determine that plants require air, water, light, and a source of energy and building material for growth and repair.
L.OL.04.16	Determine that animals require air, water, and a source of energy and building material for growth and repair.
Life Science	Evolution
Statement L.EV.E.2	Survival- Individuals of the same kind differ in their characteristics, and sometimes the differences give individuals an advantage in surviving and reproducing.
L.EV.04.21	Identify individual differences (for example: color, leg length, size, wing size) in organisms of the same kind.
L.EV.04.22	Identify how variations in physical characteristics of individual organisms give them an advantage for survival and reproduction.
Earth Science	Earth in Space and Time
Statement E.ST.E.1	Characteristics of Objects in the Sky- Common objects in the sky have observable characteristics.

GLCE Code	Expectation
E.ST.04.11	Identify common objects in the sky, such as the sun and the moon.
E.ST.04.12	Compare and contrast the characteristics of the sun, moon and Earth, including relative distances and abilities to support life.
Statement E.ST.E.2	Patterns of Objects in the Sky- Common objects in the sky have observable characteristics and predictable patterns of movement.
E.ST.04.21	Describe the orbit of the Earth around the sun as it defines a year.
E.ST.04.22	Explain that the spin of the Earth creates day and night.
E.ST.04.23	Describe the motion of the moon around the Earth.
E.ST.04.24	Explain how the visible shape of the moon follows a predictable cycle which takes approximately one month.
E.ST.04.25	Describe the apparent movement of the sun and moon across the sky through day/night and the seasons.

Fifth Grade

GLCE Code	Expectation
Science Processes	Inquiry Process
Statement S.IP.M.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.
S.IP.05.11	Generate scientific questions based on observations, investigations, and research.
S.IP.05.12	Design and conduct scientific investigations.
S.IP.05.16	Identify patterns in data.
Science Processes	Inquiry Analysis and Communication
Statement S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.
S.IA.05.11	Analyze information from data tables and graphs to answer scientific questions.
S.IA.05.12	Evaluate data, claims, and personal knowledge through collaborative science discourse.
S.IA.05.13	Communicate and defend findings of observations and investigations using evidence.
S.IA.05.14	Draw conclusions from sets of data from multiple trials of a scientific investigation.

GLCE Code	Expectation
S.IA.05.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.
Science Processes	Reflection and Social Implications
Statement S.RS.M.1	Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the application of science throughout history and within society.
S.RS.05.11	Evaluate the strengths and weaknesses of claims, arguments, and data.
S.RS.05.12	Describe limitations in personal and scientific knowledge.
S.RS.05.13	Identify the need for evidence in making scientific decisions.
S.RS.05.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.
S.RS.05.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.
Physical Science	Force and Motion
Statement P.FM.M.2	Force Interactions- Some forces between objects act when the objects are in direct contact (touching), such as friction and air resistance, or when they are not in direct contact (not touching), such as magnetic force, electrical force, and gravitational force.
P.FM.05.21	Distinguish between contact forces and non-contact forces.
P.FM.05.22	Demonstrate contact and non-contact forces to change the motion of an object.
Statement P.FM.M.3	Force- Forces have a magnitude and direction. Forces can be added. The net force on an object is the sum of all of the forces acting on the object. The speed and/or direction of motion of an object changes when a non-zero net force is applied to it. A balanced force on an object does not change the motion of the object (the object either remains at rest or continues to move at a constant speed in a straight line).
P.FM.05.31	Describe what happens when two forces act on an object in the same or opposing directions.
P.FM.05.32	Describe how constant motion is the result of balanced (zero net) forces.
P.FM.05.33	Describe how changes in the motion of objects are caused by a non-zero net (unbalanced) force.
P.FM.05.34	Relate the size of change in motion to the strength of unbalanced forces and the mass of the object.
Statement P.FM.M.4	Speed- Motion can be described by a change in position relative to a point of reference. The motion of an object can be described by its speed and the direction it is moving. The position and speed of an object can be measured and graphed as a function of time.

GLCE Code	Expectation
P.FM.05.41	Explain the motion of an object relative to its point of reference.
P.FM.05.42	Describe the motion of an object in terms of distance, time and direction, as the object moves, and in relationship to other objects.
Life Science	Evolution
Statement L.EV.M.1	Species Adaptation and Survival- Species with certain traits are more likely than others to survive and have offspring in particular environments. When an environment changes, the advantage or disadvantage of the species' characteristics can change. Extinction of a species occurs when the environment changes and the characteristics of a species are insufficient to allow survival.
L.EV.05.11	Explain how behavioral characteristics (adaptation, instinct, learning, habit) of animals help them to survive in their environment.
L.EV.05.12	Describe the physical characteristics (traits) of organisms that help them survive in their environment.
L.EV.05.14	Analyze the relationship of environmental change and catastrophic events (for example: volcanic eruption, floods, asteroid impacts, tsunami) to species extinction.
Statement L.EV.M.2	Relationships Among Organisms- Similarities among organisms are found in anatomical features, which can be used to infer the degree of relatedness among organisms. In classifying organisms, biologists consider details of internal and external structures to be more important than behavior or general appearance.
L.EV.05.21	Relate degree of similarity in anatomical features to the classification of contemporary organisms.
Earth Science	Earth Systems
Statement E.ES.M.6	Seasons- Seasons result from annual variations in the intensity of sunlight and length of day due to the tilt of the axis of the Earth relative to the plane of its yearly orbit around the sun.
E.ES.05.61	Demonstrate using a model, seasons as the result of variations in the intensity of sunlight caused by the tilt of the Earth on its axis, and revolution around the sun.
E.ES.05.62	Explain how the revolution of the Earth around the sun defines a year.
Earth Science	Earth in Space and Time
Statement E.ST.M.1	Solar System- The sun is the central and largest body in our solar system. Earth is the third planet from the sun in a system that includes other planets and their moons, as well as smaller objects, such as asteroids and comets.
E.ST.05.11	Design a model that describes the position and relationship of the planets and other objects (comets and asteroids) to the sun.
Statement E.ST.M.2	Solar System Motion- Gravity is the force that keeps most objects in the solar system in regular and predictable motion.
E.ST.05.21	Describe the motion of planets and moons in terms of rotation on axis and orbits due to

GLCE Code	Expectation
	gravity.
E.ST.05.22	Explain moon phases as they relate to the position of the moon in its orbit around the Earth, resulting in the amount of observable reflected light.
E.ST.05.23	Recognize that nighttime objects (stars and constellations) and the sun appear to move because the Earth rotates on its axis and orbits the sun.
E.ST.05.25	Explain the tides of the oceans as they relate to the gravitational pull and orbit of the moon.

Sixth Grade

GLCE Code	Expectation
Science Processes	Inquiry Process
Statement S.IP.M.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.
S.IP.06.11	Generate scientific questions based on observations, investigations, and research.
S.IP.06.12	Design and conduct scientific investigations.
S.IP.06.16	Identify patterns in data.
Science Processes	Inquiry Analysis and Communication
Statement S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.
S.IA.06.11	Analyze information from data tables and graphs to answer scientific questions.
S.IA.06.12	Evaluate data, claims, and personal knowledge through collaborative science discourse.
S.IA.06.13	Communicate and defend findings of observations and investigations using evidence.
S.IA.06.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.
Science Processes	Reflection and Social Implications
Statement S.RS.M.1	Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the application of science throughout history and within society.
S.RS.06.11	Evaluate the strengths and weaknesses of claims, arguments, and data.
S.RS.06.12	Describe limitations in personal and scientific knowledge.
S.RS.06.13	Identify the need for evidence in making scientific decisions.

GLCE Code	Expectation
S.RS.06.14	Evaluate scientific explanations based on current evidence and scientific principles.
S.RS.06.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.
S.RS.06.18	Describe what science and technology can and cannot reasonably contribute to society.
S.RS.06.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.
Physical Science	Energy
Statement P.EN.M.1	Kinetic and Potential Energy- Objects and substances in motion have kinetic energy. Objects and substances may have potential energy due to their relative positions in a system. Gravitational, elastic, and chemical energy are all forms of potential energy.
P.EN.06.11	Identify kinetic or potential energy in everyday situations (for example: stretched rubber band, objects in motion, ball on a hill, food energy).
P.EN.06.12	Demonstrate the transformation between potential and kinetic energy in simple mechanical systems (for example: roller coasters, pendulums).
Statement P.EN.M.4	Energy Transfer- Energy is transferred from a source to a receiver by radiation, conduction, and convection. When energy is transferred from a source to a receiver, the quantity of energy before the transfer is equal to the quantity of energy after the transfer.
P.EN.06.41	Explain how different forms of energy can be transferred from one place to another by radiation, conduction, or convection.
P.EN.06.42	Illustrate how energy can be transferred while no energy is lost or gained in the transfer.
Physical Science	Changes in Matter
Statement P.CM.M.1	Changes in State- Matter changing from state to state can be explained by using models which show that matter is composed of tiny particles in motion. When changes of state occur, the atoms and/or molecules are not changed in structure. When the changes in state occur, mass is conserved because matter is not created or destroyed.
P.CM.06.11	Describe and illustrate changes in state, in terms of the arrangement and relative motion of the atoms or molecules.
P.CM.06.12	Explain how mass is conserved as it changes from state to state in a closed system.
Earth Science	Solid Earth
E.SE.06.12	Explain how waves, wind, water, and glacier movement, shape and reshape the land surface of the Earth by eroding rock in some areas and depositing sediments in other areas.

GLCE Code	Expectation
Statement E.SE.M.5	Plate Tectonics- The lithospheric plates of the Earth constantly move, resulting in major geological events, such as earthquakes, volcanic eruptions, and mountain building.
E.SE.06.51	Explain plate tectonic movement and how the lithospheric plates move centimeters each year.
E.SE.06.52	Demonstrate how major geological events (earthquakes, volcanic eruptions, mountain building) result from these plate motions.
E.SE.06.53	Describe layers of the Earth as a lithosphere (crust and upper mantle), convecting mantle, and dense metallic core.
Statement E.SE.M.6	Magnetic Field of Earth- Earth as a whole has a magnetic field that is detectable at the surface with a compass.
E.SE.06.61	Describe the Earth as a magnet and compare the magnetic properties of the Earth to that of a natural or man-made magnet.

Grade Seven

GLCE Code	Expectation
Science Processes	Inquiry Process
Statement S.IP.M.1	Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.
S.IP.07.11	Generate scientific questions based on observations, investigations, and research.
S.IP.07.12	Design and conduct scientific investigations.
S.IP.07.14	Use metric measurement devices in an investigation.
S.IP.07.16	Identify patterns in data.
Science Processes	Inquiry Analysis and Communication
Statement S.IA.M.1	Inquiry includes an analysis and presentation of findings that lead to future questions, research, and investigations.
S.IA.07.11	Analyze information from data tables and graphs to answer scientific questions.
S.IA.07.12	Evaluate data, claims, and personal knowledge through collaborative science discourse.
S.IA.07.13	Communicate and defend findings of observations and investigations.

GLCE Code	Expectation
S.IA.07.14	Draw conclusions from sets of data from multiple trials of a scientific investigation to draw conclusions.
S.IA.07.15	Use multiple sources of information to evaluate strengths and weaknesses of claims, arguments, or data.
Science Processes	Reflection and Social Implications
Statement S.RS.M.1	Reflecting on knowledge is the application of scientific knowledge to new and different situations. Reflecting on knowledge requires careful analysis of evidence that guides decision-making and the application of science throughout history and within society.
S.RS.07.11	Evaluate the strengths and weaknesses of claims, arguments, and data.
S.RS.07.12	Describe limitations in personal and scientific knowledge.
S.RS.07.13	Identify the need for evidence in making scientific decisions.
S.RS.07.14	Evaluate scientific explanations based on current evidence and scientific principles.
S.RS.07.15	Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.
S.RS.07.18	Describe what science and technology can and cannot reasonably contribute to society.
S.RS.07.19	Describe how science and technology have advanced because of the contributions of many people throughout history and across cultures.
Physical Science	Energy
Statement P.EN.M.3	Waves and Energy-Waves have energy and transfer energy when they interact with matter. Examples of waves include sound waves, seismic waves, waves on water, and light waves.
P.EN.07.31	Identify examples of waves, including sound waves, seismic waves, and waves on water.
P.EN.07.32	Describe how waves are produced by vibrations in matter.
Statement P.EN.M.6	Solar Energy Effects- Nuclear reactions take place in the sun producing heat and light. Only a tiny fraction of the light energy from the sun reaches Earth, providing energy to heat the Earth.
P.EN.07.61	Identify that nuclear reactions take place in the sun, producing heat and light.
P.EN.07.62	Explain how only a tiny fraction of light energy from the sun is transformed to heat energy on Earth.

GLCE Code	Expectation
Earth Science	Earth Systems
Statement E.ES.M.1	Solar Energy- The sun is the major source of energy for phenomena on the surface of the Earth.
E.ES.07.12	Describe the relationship between the warming of the atmosphere of the Earth by the sun and convection within the atmosphere and oceans.
E.ES.07.13	Describe how the warming of the Earth by the sun produces winds and ocean currents.
Statement E.ES.M.7	Weather and Climate- Global patterns of atmospheric and oceanic movement influence weather and climate.
E.ES.07.72	Describe how different weather occurs due to the constant motion of the atmosphere from the energy of the sun reaching the surface of the Earth.
E.ES.07.73	Explain how the temperature of the oceans affects the different climates on Earth because water in the oceans holds a large amount of heat.
Earth Science	Fluid Earth
Statement E.FE.M.1	Atmosphere- The atmosphere is a mixture of nitrogen, oxygen and trace gases that include water vapor. The atmosphere has different physical and chemical composition at different elevations.
E.FE.07.11	Describe the atmosphere as a mixture of gases.

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