Embedded Inquiry

Conceptual Strand - *Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21st century.*

Guiding Question - *What tools, skills, knowledge, and dispositions are needed to conduct scientific inquiry?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.Inq.1 Observe the world of familiar objects using the senses and tools.	✓0007.Inq.1 Use senses and simple tools to make observations.	**Not addressed**	**Connections to Nature of Science** **Scientific Investigations Use a Variety of Methods** • Scientists use different ways to study the world. (K-PS2-1) **Scientific Knowledge is Based on Empirical Evidence** • Scientists look for patterns and order when making observations about the world. (K-LS1-1)
GLE 0007.Inq.2 Ask questions, make logical predictions, plan investigations, and represent data.	✓0007.Inq.2 Communicate interest in simple phenomena and plan for simple investigations.	**Not addressed**	**Asking Questions and Defining Problems** • Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested. • Ask questions based on observations to find more information about the designed world. (K-ESS3-2) **Planning and Carrying Out Investigations** • Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • With guidance, plan and conduct an investigation in collaboration with peers. (K-PS2-1)
GLE 0007.Inq.3 Explain the data from an investigation.	✓0007.Inq.3 Communicate understanding of simple data using age-appropriate vocabulary. ✓0007.Inq.4 Collect, discuss, and communicate findings from a variety of investigations.	**Not addressed**	**Analyzing and Interpreting Data** • Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Analyze data from tests of an object or tool to determine if it works as intended. (K-PS2-2)

Embedded Technology & Engineering

Conceptual Strand - *Society benefits when engineers apply scientific discoveries to design materials and processes that develop into enabling technologies.*
Guiding Question - *How do science concepts, engineering skills, and applications of technology improve the quality of life?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.T/E.1 Recognize that both natural materials and human-made tools have specific characteristics that determine their uses.	✓0007.T/E.1 Explain how simple tools are used to extend the senses, make life easier, and solve everyday problems.	**Not addressed**	**Developing and Using Models** • Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, storyboard) that represent concrete events or design solutions. • Use a model to represent relationships in the natural world. (K-ESS3-1)
GLE 0007.T/E.2 Apply engineering design and creative thinking to solve practical problems.	✓0007.T/E.2 Invent designs for simple products. ✓0007.T/E.3 Use tools to measure materials and construct simple products.	**Not addressed**	**Constructing Explanations and Designing Solutions** • Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. • Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem. (K-PS3-2) **Obtaining, Evaluating, and Communicating Information** • Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. • Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. (K-ESS3-2) • Communicate solutions with others in oral and/or written forms using models and/or drawings that provide data about scientific ideas. (K-ESS3-3)

Standard 1 – Cells

Conceptual Strand 1 - *All living things are made of cells that perform functions necessary for life.*

Guiding Question 1 - *How are plant and animals cells organized to carry on the processes of life?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.1.1 Recognize that many things are made of parts.	✓0007.1.1 Use puzzles to determine that there are many parts that make up a whole. ✓0007.1.2 Use building blocks to create a whole from the part. ✓0007.1.3 Take apart an object and describe how the parts work together.	**Not addressed**	**Not addressed**

Standard 2 – Interdependence

Conceptual Strand 2 - *All life is interdependent and interacts with the environment.*

Guiding Question 2 - *How do living things interact with one another and with the non-living elements of their environment?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.2.1 Recognize that some things are living and some are not.	✓0007.2.1 Categorize objects or images of objects as living or non-living according to their characteristics.	**Not addressed**	**Not addressed**
GLE 0007.2.2 Know that people interact with their environment through their senses.	✓0007.2.2 Use the senses to investigate and describe an object.	**Not addressed**	**Not addressed**

Standard 3 – Flow of Matter & Energy

Conceptual Strand 3 – *Matter and energy flow through the biosphere.*

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Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.3.1 Recognize that living things require water, food, and air.	✓0007.3.1 Observe plants and animals and make records of their similarities and differences. ✓0007.3.2 Record information about the care, feeding, and maintenance of a living thing.	**Not addressed**	**K-LS1-1.** **Use observations to describe patterns of what plants and animals (including humans) need to survive.** **K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.**

Standard 4 – Heredity

Conceptual Strand 4 – *Plants and animals reproduce and transmit heredity information.*

Guiding Question 4 – *What are the principal mechanisms by which living things reproduce and transmit information between parents and offspring?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.4.1 Observe how plants and animals change as they grow.	✓0007.4.1 Observe a plant to identify how it changes as it grows from a seed to the adult plant and record data using non-standard measurement devices.	**Not addressed**	**Not addressed**
GLE 0007.4.2 Observe that offspring resemble their parents.	✓0007.4.2 Match pictures of seedlings to adult plants and a juvenile to the adult animal.	**Not addressed**	**Not addressed**

Standard 5 – Biodiversity & Change

Conceptual Strand 5 – *A rich diversity of complex organisms have developed in response to a continually changing environment.*

Guiding Question 5 – *How does natural selection explain haw organisms have changed over time?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.5.1 Compare the basic features of plants and animals.	✓0007.5.1 Use a variety of representations to describe similarities and differences among plants and animals. ✓0007.5.2 Create a mural of an ecosystem and compare the characteristics of animals and plants within that environment. ✓0007.5.3 Match pictures of animal and plant characteristics needed for survival to appropriate environments.	**Not addressed**	**ESS2.E: Biogeology** • Plants and animals can change their environment. (KESS2-2)

Standard 6 – The Universe

Conceptual Strand 6 – *The cosmos is vast and explored well enough to know basic structures and operational principals.*

Guiding Question 6 – *What big ideas guide human understanding about the origin and structure of the universe, Earth's place in the cosmos, and observable motions and patterns in the sky?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.6.1 Know the different objects that are visible in the day and night sky.	✓0007.6.1 Create a Venn diagram to compare the objects that can be seen in the day and night sky. ✓0007.6.2 Observe, discuss, and draw objects found in the day and night sky.	**Not addressed**	**Not addressed**

Standard 7 – The Earth

Conceptual Strand 7 - *Major geologic events that occur over eons or brief moments in time continually shape and reshape the surface of the Earth, resulting in continuous global change.*

Guiding Question 7 - *How is the earth affected by long-term and short term geological cycles and the influence of man?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.7.1 Identify non-living materials found on the surface of the earth.	✓0007.7.1 Identify non-living materials found on the school site and discuss how these materials are similar and different.	**Not addressed**	**ESS3.A: Natural Resources** • Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1) **ESS3.B: Natural Hazards** • Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. (K-ESS3-2)
GLE 0007.7.2 Recognize that some objects are man-made and that some occur naturally.	✓0007.7.2 Investigate and compare a variety of non-living materials using simple tools. ✓0007.7.3 Observe familiar environments and make lists of natural and man-made objects.	**Not addressed**	**ESS3.C: Human Impacts on Earth Systems** • Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (secondary to K-ESS2-2) **K-ESS3-3.** **Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living thing in the local environment.** **ESS3.C: Human Impacts on Earth Systems** • Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. (K-ESS3-3)

Standard 8 - The Atmosphere

Conceptual Strand 8 - *The earth is surrounded by an active atmosphere and an energy system that controls the distribution life, local weather, climate, and global temperature.*

Guiding Question 8 - *How do the physical characteristics and the chemical makeup of the atmosphere influence surface processes and life on Earth?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.8.1 Collect daily weather data at different times of the year.	✓0007.8.1 Collect, compare, and record daily weather data during different seasons. ✓0007.8.2 Infer the relationship between temperature and seasonal change by maintaining a paper chain on which dates are recorded and temperature described according to different colors.	**Not addressed**	**K-ESS2-1.** **Use and share observations of local weather conditions to describe patterns over time.** **K-ESS2-2.** **Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.** **ESS2.D: Weather and Climate** • Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. (K-ESS2-1) **K-ESS3-2.** **Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to severe weather.**

Standard 9 – Matter

Conceptual Strand 9 - *The composition and structure of matter is known, and it behaves according to principles that are generally understood.*

Guiding Question 9 - *How does the structure of matter influence its physical and chemical behavior?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.9.1 Describe an object by its observable properties.	✓0007.9.1 Observe, identify, and compare the properties of various objects such as color, shape, and size.	**Not addressed**	**Not addressed**
GLE 0007.9.2 Identify objects and materials as solids or liquids.	✓0007.9.2 Observe, discuss, and compare characteristics of various solids and liquids.	**Not addressed**	**Not addressed**

Standard 10 - Energy

Conceptual Strand 10 - *Various forms of energy are constantly being transformed into other types without any net loss of energy from the system.*

Guiding Question 10 - *What basic energy related ideas are essential for understanding the dependency of the natural and man-made worlds on energy?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.10.1 Identify the sun as the source of heat and light.	✓0007.10.1 Place a thermometer in a sunny window and one in a shady area of the classroom and record the temperatures over time. Compare, discuss, and record any temperature differences.	**Not addressed**	**PS3.B: Conservation of Energy and Energy Transfer** • Sunlight warms Earth's surface. (K-PS3-1),(K-PS3-2)
GLE 0007.10.2 Investigate the effect of the sun on a variety of materials.	✓0007.10.2 Investigate the temperature differences in various locations around the school. Discuss and record the results. ✓0007.10.3 Place a thermometer under pieces of different colored paper on a sunny window. Compare results and discuss possible causes.	**Not addressed**	**K-PS3-1.** **Make observations to determine the effect of sunlight on Earth's surface.** **K-PS3-2.** **Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.**

Standard 11 – Motion

Conceptual Strand 11 - *Objects move in ways that can be observed, described, predicted, and measured.*
Guiding Question 11 - *What causes objects to move differently under different circumstances?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0007.11.1 Explore different ways that objects move.	✓0007.11.1 Use a variety of objects to demonstrate different types of movement. (e.g., straight line/zigzag, backwards/forward, side to side, in circles, fast/slow).	**Not addressed**	**K-PS2-1.** **Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.** **K-PS2-2.** **Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.** **PS2.A: Forces and Motion** • Pushes and pulls can have different strengths and directions. (KPS2-1),(K-PS2-2) • Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. (K-PS2-1),(K-PS2-2) **PS2.B: Types of Interactions** • When objects touch or collide, they push on one another and can change motion. (K-PS2-1) **PS3.C: Relationship Between Energy and Forces** • A bigger push or pull makes things go faster. (secondary to K-PS2-1) **ETS1.A: Defining Engineering Problems** • A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions. (secondary to KPS2-2)

Standard 12 - Forces in Nature

Conceptual Strand 12 - *Everything in the universe exerts a gravitational force on everything else; there is an interplay between magnetic fields and electrical currents.*
Guiding Question 12 - *What are the scientific principles that explain gravity and electromagnetism?*

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
Not addressed at this grade level.			