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 0507.Inq.1 Explore different scientific phenomena by asking questions, making logical predictions, planning investigations, and recording data.	✓0507.Inq.1 Identify specific investigations that could be used to answer a particular question and identify reasons for this choice. ✓0507.Inq.3 Maintain a science notebook that includes observations, data, diagrams, and explanations	SPI 0507.Inq.1 Select an investigation that could be used to answer a specific question.	**Planning and Carrying Out Investigations** • Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. • Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (5-PS1-4) • Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (5-PS1-3)
GLE 0507.Inq.2 Select and use appropriate tools and simple equipment to conduct an investigation.	✓0507.Inq.2 Identify tools needed to investigate specific questions.	SPI 0507.Inq.1 Select an investigation that could be used to answer a specific question.	**Scale, Proportion, and Quantity** • Natural objects exist from the very small to the immensely large. (5-PS1-1) • Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. (5-PS1-2),(5-PS1-3)
GLE 0507.Inq.3 Organize data into appropriate tables, graphs, drawings, or diagrams.	✓0507.Inq.3 Maintain a science notebook that includes observations, data, diagrams, and explanations.	SPI 0507.Inq.1 Select an investigation that could be used to answer a specific question.	**Using Mathematics and Computational Thinking** • Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions. • Measure and graph quantities such as weight to address scientific and engineering questions and problems. (5-PS1-2) **Developing and Using Models** • Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple

			models and using models to represent events and design solutions. • Use models to describe phenomena. (5-PS3-1) **Analyzing and Interpreting Data** • Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. • Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships. (5-ESS1-2)
GLE 0507.Inq.4 Identify and interpret simple patterns of evidence to communicate the findings of multiple investigations.	✓0507.Inq.4 Analyze and communicate findings from multiple investigations of similar phenomena to reach a conclusion.	SPI 0507.Inq.1 Select an investigation that could be used to answer a specific question.	**Using Mathematics and Computational Thinking** • Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions. • Measure and graph quantities such as weight to address scientific and engineering questions and problems. (5-PS1-2) **Developing and Using Models** • Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. • Develop a model to describe phenomena. (5-PS1-1) • Use models to describe phenomena. (5-PS3-1) **Connections to Nature of Science** **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** Science assumes consistent patterns in natural systems. **Analyzing and Interpreting Data**

			• Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used. • Represent data in graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships. (5-ESS1-2)
GLE 0507.Inq.5 Recognize that people may interpret the same results in different ways.	✓0507.Inq.4 Analyze and communicate findings from multiple investigations of similar phenomena to reach a conclusion.	SPI 0507.Inq.1 Select an investigation that could be used to answer a specific question.	**Not addressed**
GLE 0507.Inq.6 Compare the results of an investigation with what scientists already accept about this question.	GLE 0507.Inq.2 Select and use appropriate tools and simple equipment to conduct an investigation.	✓0507.Inq.2 Identify tools needed to investigate specific questions.	**Engaging in Argument from Evidence** • Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). • Support an argument with evidence, data, or a model. (5-PS2-1) **Connections to Nature of Science** **Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena** Science explanations describe the mechanisms for natural events. (5-LS2-1)

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 0507.T/E.1 Describe how tools, technology, and inventions help to answer questions and solve problems.	✓0507.T/E.1 Explain how different inventions and technologies impact people and other living organisms. ✓0507.T/E.2 Design a tool or a process that addresses an identified problem caused by human activity.	SPI 0507.T/E.1 Select a tool, technology, or invention that was used to solve a human problem.	**3-5-ETS1-1.** **Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.** **3-5-ETS1-2.** **Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.** **3-5-ETS1-3.** **Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.** **ETS1.A: Defining and Delimiting Engineering Problems** Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-5-ETS1-1) **ETS1.B: Developing Possible Solutions** • Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2) • At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2) • Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3)
GLE 0507.T/E.2 Recognize that new tools, technology, and inventions are always being developed.	✓0507.T/E.2 Design a tool or a process that addresses an identified problem caused by human activity. ✓0507.T/E.4 Evaluate an invention that solves a problem and determine ways to improve the design.	SPI 0507.T/E.2 Recognize the connection between a scientific advance and the development of a new tool or technology.	
GLE 0507.T/E.3 Identify appropriate materials, tools, and machines that can extend or enhance the ability to solve a specified problem.	✓0507.T/E.3 Determine criteria to evaluate the effectiveness of a solution to a specified problem. ✓0507.T/E.4 Evaluate an invention that solves a problem and determine ways to improve the design.	SPI 0507.T/E.2 Recognize the connection between a scientific advance and the development of a new tool or technology.	
GLE 0507.T/E.4 Recognize the connection between scientific advances, new knowledge, and the availability of new tools and technologies.	✓0507.T/E.4 Evaluate an invention that solves a problem and determine ways to improve the design.	SPI 0507.T/E.2 Recognize the connection between a scientific advance and the development of a new tool or technology.	
GLE 0507.T/E.5 Apply a creative design strategy to solve a particular problem generated by societal needs and wants.	**0507.T/E.2** Design a tool or a process that addresses an identified problem caused by human activity.	SPI 0507.T/E.1 Select a tool, technology, or invention that was used to solve a human problem.	

			ETS1.C: Optimizing the Design Solution Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3) **Asking Questions and Defining Problems** • Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships. • Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-5-ETS1-1) **Planning and Carrying Out Investigations** • Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-5-ETS1-3) **Constructing Explanations and Designing Solutions** • Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. • Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-5-ETS1-2) **Influence of Engineering, Technology, and Science on Society and the Natural World** • People's needs and wants change over time, as do their demands for new and improved technologies. (3-5-ETS1-1) • Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3-5-ETS-2)

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 0507.1.1 Distinguish between the basic structures and functions of plant and animal cells.	✓0507.1.1 Label drawings of plant and animals cells. ✓0507.1.2 Compare and contrast the basic structures and functions of plant and animal cells.	SPI 0507.1.1 Identify the major parts of plant and animal cells such as, the nucleus, cell membrane, cell wall, and cytoplasm. SPI 0507.1.2 Compare and contrast basic structures and functions of plant and animal cells.	**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 0507.2.1 Investigate different nutritional relationships among organisms in an ecosystem.	✓0507.2.1 Evaluate producer/consumer, predator/prey, and parasite/host relationships. ✓0507.2.3 Create a simple model illustrating the interspecific relationships within an ecosystem. ✓0507.2.4 Analyze basic information from a body of text to identify key issues or assumptions about the relationships among organisms in an ecosystem.	SPI 0507.2.1 Describe the different types of nutritional relationships that exist among organisms. SPI 0507.2.2 Distinguish among symbiotic, commensal, and parasitic relationships. SPI 0507.2.3 Use information about the impact of human actions or natural disasters on the environment to support a simple hypothesis, make a prediction, or draw a conclusion.	**5-PS3-1.** **Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.** **PS3.D: Energy in Chemical Processes and Everyday Life** The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1) **LS1.C: Organization for Matter and Energy Flow in Organisms** Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1) **Energy and Matter** Energy can be transferred in various ways and between objects. (5-PS3-1) **5-LS1-1.** **Support an argument that plants get the materials they need for growth chiefly from air and water.** **LS1.C: Organization for Matter and Energy Flow in Organisms** Plants acquire their material for growth chiefly from air and water. (5-LS1-1) **5-LS2-1.** **Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.** **LS2.A: Interdependent Relationships in Ecosystems** The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.

			Newly introduced species can damage the balance of an ecosystem. (5-LS2-1) **LS2.B: Cycles of Matter and Energy Transfer in Ecosystems** Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)
GLE 0507.2.2 Explain how organisms interact through symbiotic, commensal, and parasitic relationships.	✓0507.2.2 Classify interspecific relationships within an ecosystem as mutualism, commensalism, or parasitism.	SPI 0507.2.2 Distinguish among symbiotic, commensal, and parasitic relationships.	**5-LS2-1.** **Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.** **LS2.A: Interdependent Relationships in Ecosystems** The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1) **LS2.B: Cycles of Matter and Energy Transfer in Ecosystems** Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)
GLE 0507.2.3 Establish the connections between human activities and natural disasters and their impact on the environment.	✓0507.2.5 Create a poster to illustrate how human activities and natural disasters affect the environment.	SPI 0507.2.3 Use information about the impact of human actions or natural disasters on the environment to support a simple hypothesis, make a prediction, or draw a conclusion.	**Not addressed**

Standard 3 – Flow of Matter & Energy

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

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

Grade Level Expectations (GLE)	Checks For Understanding (CFU)	State Performance Indicator (SPI)	Next Generation Science Standards (NGSS)
GLE 0507.3.1 Demonstrate how all living things rely on the process of photosynthesis to obtain energy.	✓0507.3.1 Identify the cell structures that enable plants to conduct photosynthesis. ✓0507.3.2 Design a graphic organizer that illustrates the difference between plants and animals in the movement of food energy through an ecosystem.	SPI 0507.3.1 Identify photosynthesis as the food manufacturing process in plants. SPI 0507.3.2 Compare how plants and animals obtain energy.	**5-PS3-1.** **Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.** **PS3.D: Energy in Chemical Processes and Everyday Life** The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1) **LS1.C: Organization for Matter and Energy Flow in Organisms** Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1) **Energy and Matter** Energy can be transferred in various ways and between objects. (5-PS3-1) **5-LS1-1.** **Support an argument that plants get the materials they need for growth chiefly from air and water.** **LS1.C: Organization for Matter and Energy Flow in Organisms** Plants acquire their material for growth chiefly from air and water. (5-LS1-1)

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 0507.4.1 Describe how genetic information is passed from parents to offspring during reproduction.	✓0507.4.1 Explain how genetic information is transmitted from parents to offspring.	SPI 0507.4.1 Recognize that information is passed from parent to offspring during reproduction.	**Not addressed**
GLE 0507.4.2 Recognize that some characteristics are inherited while others result from interactions with the environment.	✓0507.4.2 Create a chart that compares hereditary and environmental traits. ✓0507.4.3 Distinguish between a scar and a birthmark in terms of their origins.	SPI 0507.4.2 Distinguish between inherited traits and those that can be attributed to the environment.	**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 0507.5.1 Investigate physical characteristics associated with different groups of animals.	✓0507.5.1 Classify animals according to their physical characteristics. ✓0507.5.2 Design a model to illustrate how an animal's physical characteristics enable it to survive in a particular environment.	SPI 0507.5.1 Identify physical and behavioral adaptations that enable animals such as, amphibians, reptiles, birds, fish, and mammals to survive in a particular environment.	**5-LS2-1.** **Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.**
GLE 0507.5.2 Analyze fossils to demonstrate the connection between organisms and environments that existed in the past and those that currently exist.	✓0507.5.3 Identify the processes associated with fossil formation. ✓0507.5.4 Use fossil evidence to describe an environment from the past. ✓0507.5.5 Use fossils to match a previously existing organism with one that exists today.	SPI 0507.5.2 Explain how fossils provide information about the past.	**Not addressed**

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 0507.6.1 Compare planets based on their known characteristics.	✓0507.6.1 Develop a chart that communicates the major characteristics of each planet.	SPI 0507.6.1 Organize the phases of the moon in the correct sequence. SPI 0507.6.2 Use images of the night sky to identify different seasonal star patterns.	**ESS1.B: Earth and the Solar System** The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun, moon, and stars at different times of the day, month, and year. (5-ESS1-2)
GLE 0507.6.2 Recognize that charts can be used to locate and identify star patterns.	✓0507.6.2 Sequence the major phases of the moon during a lunar cycle. ✓0507.6.3 Research a star pattern using a chart.	SPI 0507.6.3 Identify methods and tools for identifying star patterns.	**5-ESS1-1.** **Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth.** **5-ESS1-2.** **Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.** **ESS1.A: The Universe and its Stars** The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1)

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 0507.7.1 Compare geologic events responsible for the earth's major geological features.	✓0507.7.1 Create a model to illustrate geologic events responsible for changes in the earth's crust. ✓0507.7.2 Prepare a chart to compare how volcanoes, earthquakes, faulting, and plate movements affect the earth's surface features.	SPI 0507.7.1 Describe internal forces such as volcanoes, earthquakes, faulting, and plate movements that are responsible for the earth's major geological features such as mountains, valleys, etc.	**Not addressed**
Not addressed	**Not addressed**	**Not addressed**	**5-ESS3-1.** **Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.** **ESS3.C: Human Impacts on Earth Systems** Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)

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 0507.8.1 Analyze and predict how major landforms and bodies of water affect atmospheric conditions.	✓0507.8.1 Compare the climates of coastal and inland areas at similar latitudes to demonstrate the ocean's impact on weather and climate. ✓0507.8.2 Use land maps to demonstrate how mountain ranges affect weather and climate. ✓0507.8.3 Use weather maps of the United States to graph temperature and precipitation for inland and coastal regions. ✓0507.8.4 Use local environmental information to analyze how weather and climate are affected by landforms and bodies of water.	SPI 0507.8.1 Describe the effects of the oceans on weather and climate. SPI 0507.8.2 Explain how mountains affect weather and climate.	**Not addressed**

Not addressed	**Not addressed**	**Not addressed**	**5-ESS2-1.** **Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.** **5-ESS2-2.** **Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.** **ESS2.A: Earth Materials and Systems** Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1) **ESS2.C: The Roles of Water in Earth's Surface Processes** Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5-ESS2-2)

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 0507.9.1 Observe and measure the simple chemical properties of common substances.	✓0507.9.1 Compare the simple chemical properties of common substances.	SPI 0507.9.1 Distinguish between physical and chemical properties.	**5-PS1-3.** **Make observations and measurements to identify materials based on their properties.** **5-PS1-4.** **Conduct an investigation to determine whether the mixing of two or more substances results in new substances.** **PS1.A: Structure and Properties of Matter** Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3) **PS1.B: Chemical Reactions** • When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4) • No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5-PS1-2)
GLE 0507.9.2 Design and conduct an experiment to demonstrate how various types of matter freeze, melt, or evaporate.	✓0507.9.2 Investigate how different types of materials freeze, melt, evaporate, or dissipate.	SPI 0507.9.2 Describe the differences among freezing, melting, and evaporation.	**5-PS1-2.** **Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.**
GLE 0507.9.3 Investigate factors that affect the rate at which various materials freeze, melt, or evaporate.	✓0507.9.3 Use data from a simple investigation to determine how temperature change	SPI 0507.9.3 Describe factors that influence the rate at which different	**5-PS1-2.** **Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing**

	affects the rate of evaporation and condensation.	types of material freeze, melt, or evaporate.	**substances, the total weight of matter is conserved.**
Not addressed	**Not addressed**	**Not addressed**	**5-PS1-1.** **Develop a model to describe that matter is made of particles too small to be seen.** **PS1.A: Structure and Properties of Matter** • Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model shows that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects. (5-PS1-1) • The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2)

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 0507.10.1 Design an experiment to illustrate the difference between potential and kinetic energy.	✓0507.10.1 Design and conduct an investigation to demonstrate the difference between potential and kinetic energy. ✓0507.10.2 Create a graphic organizer that illustrates different types of potential and kinetic energy. ✓0507.10.3 Describe the differences among conduction, convection, and radiation.	SPI 0507.10.1 Differentiate between potential and kinetic energy. SPI 0507.10.2 Use data from an investigation to determine the method by which heat energy is transferred from one object or material to another.	**Not addressed**
GLE 0507.10.2 Conduct experiments on the transfer of heat energy through conduction, convection, and radiation.	✓0507.10.3 Describe the differences among conduction, convection, and radiation. ✓0507.10.4 Create a poster to illustrate the major forms of energy. ✓0507.10.5 Demonstrate different ways that energy can be transferred from one object to another.	SPI 0507.10.2 Use data from an investigation to determine the method by which heat energy is transferred from one object or material to another.	**Not addressed**

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 0507.11.1 Design an investigation, collect data and draw conclusions about the relationship among mass, force, and distance traveled.	✓0507.11.1 Predict how the amount of mass affects the distance traveled given the same amount of applied force. ✓0507.11.2 Prepare statements about the relationship among mass, applied force, and distance traveled. ✓0507.11.3 Design and conduct experiments using a simple experimental design to demonstrate the relationship among mass, force, and distance traveled.	SPI 0507.11.1 Explain the relationship that exist among mass, force, and distance traveled.	**Not addressed**

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)
GLE 0507.12.1 Recognize that the earth attracts objects without directly touching them.	✓0507.12.1 Explain and give examples of how forces act at a distance.	SPI 0507.12.1 Recognize that the earth attracts objects without touching them. SPI 0507.12.2 Identify the force that causes objects to fall to the earth.	**Not addressed**
GLE 0507.12.2 Investigate how the shape of an object influences the way that it falls toward the earth.	✓0507.12.2 Demonstrate how the shape of an object affects how it falls toward the earth.	SPI 0507.12.2 Identify the force that causes objects to fall to the earth. SPI 0507.12.3 Use data to determine how shape affects the rate at which a material falls to earth.	**5-PS2-1.** **Support an argument that the gravitational force exerted by Earth on objects is directed down.** **PS2.B: Types of Interactions** The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. (5-PS2-1)
GLE 0507.12.3 Provide examples of how forces can act at a distance.	✓0507.12.3 Design and explain an investigation exploring the earth's pull on objects.	SPI 0507.12.1 Recognize that the earth attracts objects without touching them.	**Not addressed**