TENNESSEE

SCIENCE

STANDARDS

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GRADES K-8

EARTH AND SPACE SCIENCE

KINDERGARTEN

Kindergarten : 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	Checks for Understanding	State Performance Indicators
GLE 0007.Inq.1 Observe the world of familiar objects using the senses and tools. **GLE 0007.Inq.2** Ask questions, make logical predictions, plan investigations, and represent data. **GLE 0007.Inq.3** Explain the data from an investigation.	**√0007.Inq.1** Use senses and simple tools to make observations. **√0007.Inq.2** Communicate interest in simple phenomena and plan for simple investigations. **√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.	

Kindergarten : 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	Checks for Understanding	State Performance Indicators
GLE 0007.T/E.K-2.1 Recognize that both natural materials and human-made tools have specific characteristics that determine their use. **GLE 0007.T/E.2** Apply engineering design and creative thinking to solve practical problems.	√**0007.T/E.1** Explain how simple tools are used to extend the senses, make life easier, and solve everyday problems. √**0007.T/E.2** Invent designs for simple products. √**0007.T/E.3** Use tools to measure materials and construct simple products.	

Kindergarten - Earth and Space Science

Kindergarten : Standard 6 -The Universe

Conceptual Strand 6

The cosmos is vast and explored well enough to know its basic structure and operational principles.

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	Checks for Understanding	State Performance Indicators
GLE 0007.6.1 Know the different objects that compare are visible in the day and night sky.	√**0007.6.1** Create a Venn diagram to 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.	

Kindergarten : 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	Checks for Understanding	State Performance Indicators
GLE0007.7.1 Identify non-living materials found on the surface of the earth. **GLE0007.7.2** Recognize that some objects are manmade and that some occur naturally.	√**0007.7.1** Identify non-living materials found on the school site and discuss how these materials are similar and different. √**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 manmade objects.	

Kindergarten : Standard 8 -The Atmosphere

Conceptual Strand 8

The earth is surrounded by an active atmosphere and an energy system that controls the distribution of 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	Checks for Understanding	State Performance Indicators
GLE 0007.8.2 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.	

1st GRADE

Grade 1 : 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	Checks for Understanding	State Performance Indicators
GLE 0107.Inq.1 Observe the world of familiar objects using the senses and tools. **GLE 0107.Inq.2** Ask questions, make logical predictions, plan investigations, and represent data. **GLE 0107.Inq.3** Explain the data from an investigation.	√**0107.Inq.1** Use senses and simple tools to make observations. √**0107.Inq.2** Communicate interest in simple phenomena and plan for simple investigations. √**0107.Inq.3** Communicate understanding of simple data using age-appropriate vocabulary. √**0107.Inq.4** Collect, discuss, and communicate findings from a variety of investigations.	

Grade 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	Checks for Understanding	State Performance Indicators
GLE 0107.T/E.1 Recognize that both natural materials and human-made tools have specific characteristics that determine their use. **GLE 0107.T/E.2** Apply engineering design and creative thinking to solve practical problems.	√**0107.T/E.1** Explain how simple tools are used to extend the senses, make life easier, and solve everyday problems. √**0107.T/E.2** Invent designs for simple products. √**0107.T/E.3** Use tools to measure materials and construct simple products.	

Grade 1 - Earth and Space Science

Grade 1 : Standard 6 -The Universe

Conceptual Strand 6

The cosmos is vast and explored well enough to know its basic structure and operational principles.

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	Checks for Understanding	State Performance Indicators
GLE 0107.6.1 Compare and describe features of the day and night sky. **GLE 0107.6.2** Realize that the sun can only be seen during the day, while the moon can be seen at night and sometimes during the day.	**√0107.6.1** Create a chart of things that can be observed in the day and night sky. **√0107.6.2** Identify objects in the sky and describe their observable similarities and differences.	

Grade 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	Checks for Understanding	State Performance Indicators
GLE 0107.7.1 Realize that water, rocks, soil, living organisms, and man-made objects make up the earth's surface. **GLE 0107.7.2** Classify earth materials according to their physical properties.	√**0107.7.1** Create a diagram of the school grounds to identify where water, rocks, soil, living organisms, and man-made objects are found. √**0107.7.2** Sample areas of the school grounds to identify where different materials are found. √**0107.7.3** Use bagged samples of earth materials or pictures from different areas to classify materials according to their use.	

Grade 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	Checks for Understanding	State Performance Indicators
GLE 0107.8.1 Gather and interpret daily weather data.	√**0107.8.1** Collect daily weather information to predict what conditions might occur on the following day. √**0107.8.2** Discuss what makes a weather prediction accurate or inaccurate.	

2nd GRADE

Grade 2 : 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	Checks for Understanding	State Performance Indicators
GLE 0207.Inq.1 Observe the world of familiar objects using the senses and tools. **GLE 0207.Inq.2** Ask questions, make logical predictions, plan investigations, and represent data. **GLE 0207.Inq.3** Explain the data from an investigation.	**√0207.Inq.1** Use senses and simple tools to make observations. **√0207.Inq.2** Communicate interest in simple phenomena and plan for simple investigations. **√0207.Inq.3** Communicate understanding of simple data using age-appropriate vocabulary. **√0207.Inq.4** Collect, discuss, and communicate findings from a variety of investigations.	

Grade 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	Checks for Understanding	State Performance Indicators
GLE 0207.T/E.1 Recognize that both natural materials and human-made tools have specific characteristics that determine their uses. **GLE 0207.T/E.2** Apply engineering design and creative thinking to solve practical problems.	√**0207.T/E.1** Explain how simple tools are used to extend the senses, make life easier, and solve everyday problems. √**0207.T/E.2** Invent designs for simple products. √**0207.T/E.3** Use tools to measure materials and construct simple products.	

Grade 2 - Earth and Space Science

Grade 2 : Standard 6 -The Universe

Conceptual Strand 6

The cosmos is vast and explored well enough to know its basic structure and operational principles.

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	Checks for Understanding	State Performance Indicators
GLE 0207.6.1 Realize that the sun is our nearest star and that its position in the sky appears to change. **GLE 0207.6.2** Make observations of changes in the moon's appearance over time.	**√0207.6.1** Observe and collect data on the sun's position at different times of the day. **√0207.6.2** Use science journals to draw and record changes in the moon over a period of time.	

Grade 2 : 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	Checks for Understanding	State Performance Indicators
GLE 0207.7.1 Compare and record the components of a variety of soil types. **GLE 0207.7.2** Describe rocks according to their origin, size, shape, texture, and color. **GLE 0207.7.3** Differentiate between renewable and non–renewable resources.	√**0207.7.1** Sort, analyze, and compare a variety of soil types. √**0207.7.2** Observe rocks of different sizes with a hand lens and describe these materials according to their basic features. √**0207.7.3** Identify and categorize items in the classroom made from renewable or nonrenewable resources. √**0207.7.4** Identify simple methods for reusing the earth's resources.	

Grade 2 : 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	Checks for Understanding	State Performance Indicators
GLE 0207.8.1 Associate temperature patterns with seasonal changes.	√**0207.8.1** Use records and graphs of seasonal temperature changes to draw conclusions about the weather during different times of the year.	

3rd GRADE

Grade 3 : 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	Checks for Understanding	State Performance Indicators
GLE 0307.Inq.1 Explore different scientific phenomena by asking questions, making logical predictions, planning investigations, and recording data. **GLE 0307.Inq.2** Select and use appropriate tools and simple equipment to conduct an investigation. **GLE 0307.Inq.3** Organize data into appropriate tables, graphs, drawings, or diagrams. **GLE 0307.Inq.4** Identify and interpret simple patterns of evidence to communicate the findings of multiple investigations. **GLE 0307.Inq.5** Recognize that people may interpret the same results in different ways. **GLE 0307.Inq.6** Compare the results of an investigation with what scientists already accept about this question.	√**0307.Inq.1** Identify specific investigations that could be used to answer a particular question and identify reasons for this choice. √**0307.Inq.2** Identify tools needed to investigate specific questions. √**0307.Inq.3** Maintain a science notebook that includes observations, data, diagrams, and explanations. √**0307.Inq.4** Analyze and communicate findings from multiple investigations of similar phenomena to reach a conclusion.	**SPI 0307.Inq.**1 Select an investigation that could be used to answer a specific question.

Grade 3 : 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	Checks for Understanding	State Performance Indicators
GLE 0307.T/E.1 Describe how tools, technology, and inventions help to answer questions and solve problems. **GLE 0307.T/E.2** Recognize that new tools, technology, and inventions are always being developed. **GLE 0307.T/E.3** Identify appropriate materials, tools, and machines that can extend or enhance the ability to solve a specified problem. **GLE 0307.T/E.4** Recognize the connection between scientific advances, new knowledge, and the availability of new tools and technologies. **GLE 0307.T/E.5** Apply a creative design strategy to solve a particular problem generated by societal needs and wants.	√**0307.T/E.1** Explain how different inventions and technologies impact people and other living organisms. √**0307.T/E.2** Design a tool or a process that addresses an identified problem caused by human activity. √**0307.T/E.3** Determine criteria to evaluate the effectiveness of a solution to a specified problem. √**0307.T/E.4** Evaluate an invention that solves a problem and determine ways to improve the design.	**SPI 0307.T/E.1** Select a tool, technology, or invention that was used to solve a human problem. **SPI 0307.T/E.2** Recognize the connection between a scientific advance and the development of a new tool or technology.

Grade 3 - Earth and Space Science

Grade 3 : Standard 6 -The Universe

Conceptual Strand 6

The cosmos is vast and explored well enough to know its basic structure and operational principles.

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	Checks for Understanding	State Performance Indicators
GLE 0307.6.1 Identify and compare the major components of the solar system.	√**0307.6.1** Create a model of the solar system depicting the major components and their relative positions and sizes. √**0307.6.2** Use a table to compare and contrast the major solar system components.	**SPI 0307.6.1** Identify the major components of the solar system, i.e., sun, planets and moons.

Grade 3 : 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	Checks for Understanding	State Performance Indicators
GLE 0307.7.1 Use information and illustrations to identify the earth's major landforms and water bodies. **GLE 0307.7.2** Recognize that rocks can be composed of one or more minerals. **GLE 0307.7.3** Distinguish between natural and manmade objects. **GLE 0307.7.4** Design a simple investigation to demonstrate how earth materials can be conserved or recycled.	√**0307.7.1** Use a Venn diagram to compare and contrast two different landforms or bodies of water. √**0307.7.2** Analyze the physical characteristics of different kinds of rocks. √**0307.7.3** Use a magnifier to observe, describe, and compare materials to determine if they are natural or manmade. √**0307.7.4** Design and evaluate a method for reusing or recycling classroom materials. √**0307.7.5** Create a web that demonstrates the link between basic human needs and the earth's resources.	**SPI 0307.7.1** Classify landforms and bodies of water according to their geological features and identify them on a map. **SPI 0307.7.2** Describe how rocks can be classified according to their physical characteristics. **SPI 0307.7.3** Identify an object as natural or manmade. **SPI 0307.7.4** Determine methods for conserving natural resources.

Grade 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	Checks for Understanding	State Performance Indicators
GLE 0307.8.1 Recognize that that there are a variety of atmospheric conditions that can be measured. **GLE 0307.8.2** Use tools such as the barometer, thermometer, anemometer, and rain gauge to measure atmospheric conditions. **GLE 0307.8.3** Identify cloud types associated with particular atmospheric conditions. **GLE 0307.8.4** Predict the weather based on cloud observations.	**√0307.8.1** Select appropriate tools used for collecting weather data that correspond to the atmospheric condition being measured. **√0307.8.2** Identify major cloud types and associate them with particular weather conditions.	**SPI 0307.8.1** Choose the correct tool for measuring a particular atmospheric condition. **SPI 0307.8.2** Match major cloud types with specific atmospheric conditions.

4th GRADE

Grade 4 : 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	Checks for Understanding	State Performance Indicators
GLE 0407.Inq.1 Explore different scientific phenomena by asking questions, making logical predictions, planning investigations, and recording data. **GLE 0407.Inq.2** Select and use appropriate tools and simple equipment to conduct an investigation. **GLE 0407.Inq.3** Organize data into appropriate tables, graphs, drawings, or diagrams. **GLE 0407.Inq.4** Identify and interpret simple patterns of evidence to communicate the findings of multiple investigations. **GLE 0407.Inq.5** Recognize that people may interpret the same results in different ways. **GLE 0407.Inq.6** Compare the results of an investigation with which scientists already accept about this question.	√**0407.Inq.1** Identify specific investigations that could be used to answer a particular question and identify reasons for this choice. √**0407.Inq.2** Identify tools needed to investigate specific questions. √**0407.Inq.3** Maintain a science notebook that includes observations, data, diagrams, and explanations. √**0407.Inq.4** Analyze and communicate findings from multiple investigations of similar phenomena to reach a conclusion.	**SPI 0407.Inq.**1 Select an investigation that could be used to answer a specific question.

Grade 4 : 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	Checks for Understanding	State Performance Indicators
GLE 0407.T/E.1 Describe how tools, technology, and inventions help to answer questions and solve problems. **GLE 0407.T/E.2** Recognize that new tools, technology, and inventions are always being developed. **GLE 0407.T/E.3** Identify appropriate materials, tools, and machines that can extend or enhance the ability to solve a specified problem. **GLE 0407.T/E.4** Recognize the connection between scientific advances, new knowledge, and the availability of new tools and technologies. **GLE 0407.T/E.5** Apply a creative design strategy to solve a particular problem generated by societal needs and wants.	√**0407.T/E.1** Explain how different inventions and technologies impact people and other living organisms. √**0407.T/E.2** Design a tool or a process that addresses an identified problem caused by human activity. √**0407.T/E.3** Determine criteria to evaluate the effectiveness of a solution to a specified problem. √**0407.T/E.4** Evaluate an invention that solves a problem and determine ways to improve the design.	**SPI 0407.T/E.1** Select a tool, technology, or invention that was used to solve a human problem. **SPI 0407.T/E.2** Recognize the connection between a scientific advance and the development of a new tool or technology.

Grade 4 - Earth and Space Science

Grade 4 : Standard 6 -The Universe

Conceptual Strand 6

The cosmos is vast and explored well enough to know its basic structure and operational principles.

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	Checks for Understanding	State Performance Indicators
GLE 0407.6.1 Analyze patterns, relative movements, and relationships among the sun, moon, and earth.	**√0407.6.1** Chart the movements of the sun, moon, and earth to develop an explanation for the phases of the moon and solar and lunar eclipses. **√0407.6.2** Sequence the major phases of the moon during a lunar cycle.	**SPI 0407.6.1** Organize the phases of the moon in the correct sequence. **SPI 0407.6.2** Infer that the moon's phases are caused by the revolution of the moon and earth around the sun.

Grade 4 : 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	Checks for Understanding	State Performance Indicators
GLE 0407.7.1 Investigate how the Earth's geological features change as a result of erosion (weathering and transportation) and deposition. **GLE 0407.7.2** Evaluate how some earth materials can be used to solve human problems and enhance the quality of life.	√**0407.7.1** Prepare a demonstration to illustrate how wind and water affect the earth's surface features. √**0407.7.2** Design an investigation to demonstrate how erosion and deposition change the earth's surface. √**0407.7.3** List factors that determine the appropriate use of an earth material. √**0407.7.4** Use data from a variety of informational texts to analyze and evaluate man's impact on non-renewable resources.	**SPI 0407.7.1** Design a simple model to illustrate how the wind and movement of water alter the earth's surface. **SPI 0407.7.2** Analyze how different earth materials are utilized to solve human problems or improve the quality of life.

Grade 4 : 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	Checks for Understanding	State Performance Indicators
GLE 0407.8.1 Recognize the major components of the water cycle. **GLE 0407.8.2** Differentiate between weather and climate.	√**0407.8.1** Prepare a model that illustrates the basic features of the water cycle. √**0407.8.2** Use long term weather data to distinguish between weather and climate. √**0407.8.3** Use an illustration to predict and draw conclusions about how weather and climate affect the water cycle.	**SPI 0407.8.1** Identify the basic features of the water cycle and describe their importance to life on earth. **SPI 0407.8.2** Distinguish between weather and climate.

5th GRADE

Grade 5 : 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	Checks for Understanding	State Performance Indicators
GLE 0507.Inq.1 Explore different scientific phenomena by asking questions, making logical predictions, planning investigations, and recording data. **GLE 0507.Inq.2** Select and use appropriate tools and simple equipment to conduct an investigation. **GLE 0507.Inq.3** Organize data into appropriate tables, graphs, drawings, or diagrams. **GLE 0507.Inq.4** Identify and interpret simple patterns of evidence to communicate the findings of multiple investigations. **GLE 0507.Inq.5** Recognize that people may interpret the same results in different ways. **GLE 0507.Inq.6** Compare the results of an investigation with what scientists already accept about this question.	√**0507.Inq.1** Identify specific investigations that could be used to answer a particular question and identify reasons for this choice. √**0507.Inq.2** Identify tools needed to investigate specific questions. √**0507.Inq.3** Maintain a science notebook that includes observations, data, diagrams, and explanations. √**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.

Grade 5 : 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	Checks for Understanding	State Performance Indicators
GLE 0507.T/E.1 Describe how tools, technology, and inventions help to answer questions and solve problems. **GLE 0507.T/E.2** Recognize that new tools, technology, and inventions are always being developed. **GLE 0507.T/E.3** Identify appropriate materials, tools, and machines that can extend or enhance the ability to solve a specified problem. **GLE 0507.T/E.4** Recognize the connection between scientific advances, new knowledge, and the availability of new tools and technologies. **GLE 0507.T/E.5** Apply a creative design strategy to solve a particular problem generated by societal needs and wants.	**√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. **√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.1** Select a tool, technology, or invention that was used to solve a human problem. **SPI 0507.T/E.2** Recognize the connection between a scientific advance and the development of a new tool or technology.

Grade 5 - Earth and Space Science

Grade 5 : Standard 6 -The Universe

Conceptual Strand 6

The cosmos is vast and explored well enough to know its basic structure and operational principles.

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	Checks for Understanding	State Performance Indicators
GLE0507.6.1 Compare planets based on their known characteristics. **GLE0507.6.2** Recognize that charts can be used to locate and identify star patterns.	**√0507.6.1** Develop a chart that communicates the major characteristics of each planet. **√0507.6.2** Use images of the night sky to identify different seasonal star patterns. **√0507.6.3** Research a star pattern using a chart.	**SPI 0507.6.1** Distinguish among the planets according to their know characteristics such as appearance, location, composition, and apparent motion. **SPI 0507.6.2** Select information from a complex data representation to draw conclusions about the planets. **SPI 0507.6.3** Identify methods and tools for identifying star patterns.

Grade 5 : 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	Checks for Understanding	State Performance Indicators
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 valleys, etc. 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.

Grade 5 : 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	Checks for Understanding	State Performance Indicators
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.

6th GRADE

Grade 6 : 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	Checks for Understanding	State Performance Indicators
GLE 0607.Inq.1 Design and conduct open-ended scientific investigations. **GLE 0607.Inq.2** Use appropriate tools and techniques to gather, organize, analyze, and interpret data. **GLE 0607.Inq.3** Synthesize information to determine cause and effect relationships between evidence and explanations. **GLE 0607.Inq.4** Recognize possible sources of bias and error, alternative explanations, and questions for further exploration. **GLE 0607.Inq.5** Communicate scientific understanding using descriptions, explanations, and models.	√**0607.Inq.1** Design and conduct an open-ended scientific investigation to answer a question that includes a control and appropriate variables. √**0607.Inq.2** Identify tools and techniques needed to gather, organize, analyze, and interpret data collected from a moderately complex scientific investigation. √**0607.Inq.3** Use evidence from a dataset to determine cause and effect relationships that explain a phenomenon. √**0607.Inq.4** Review an experimental design to determine possible sources of bias or error, state alternative explanations, and identify questions for further investigation. √**0607.Inq.5** Design a method to explain the results of an investigation using descriptions, explanations, or models.	**SPI 0607.Inq.1** Design a simple experimental procedure with an identified control and appropriate variables. **SPI 0607.Inq.2** Select tools and procedures needed to conduct a moderately complex experiment. **SPI 0607.Inq.3** Interpret and translate data into a table, graph, or diagram. **SPI 0607.Inq.4** Draw a conclusion that establishes a cause and effect relationship supported by evidence. **SPI 0607.Inq.5** Identify a faulty interpretation of data that is due to bias or experimental error.

Grade 6 : 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	Checks for Understanding	State Performance Indicators
GLE 0607.T/E.1 Explore how technology responds to social, political, and economic needs. **GLE 0607.T/E.2** Know that the engineering design process involves an ongoing series of events that incorporate design constraints, model building, testing, evaluating, modifying, and retesting. **GLE 0607.T/E.3** Compare the intended benefits with the unintended consequences of a new technology. **GLE 0607.T/E.4** Describe and explain adaptive and assistive bioengineered products.	√**0607.T/E.1** Use appropriate tools to test for strength, hardness, and flexibility of materials. √**0607.T/E.2** Apply the engineering design process to construct a prototype that meets certain specifications. √**0607.T/E.3** Explore how the unintended consequences of new technologies can impact society. √**0607.T/E.4** Research bioengineering technologies that advance health and contribute to improvements in our daily lives. √**0607.T/E.5** Develop an adaptive design and test its effectiveness.	**SPI 0607.T/E.1** Identify the tools and procedures needed to test the design features of a prototype. **SPI 0607.T/E.2** Evaluate a protocol to determine if the engineering design process was successfully applied. **SPI 0607.T/E.3** Distinguish between the intended benefits and the unintended consequences of a new technology. **SPI 0607.T/E.4** Differentiate between adaptive and assistive bioengineered products (e.g., food, biofuels, medicines, integrated pest management).

Grade 6 - Earth and Space Science

Grade 6 : Standard 6 -The Universe

Conceptual Strand 6

The cosmos is vast and explored well enough to know its basic structure and operational principles.

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	Checks for Understanding	State Performance Indicators
GLE 0607.6.1 Analyze information about the major components of the universe.	**√0607.6.1** Use data to draw conclusions about the major components of the universe.	**SPI 0607.6.1** Use data to draw conclusions about the major components of the universe.
GLE 0607.6.2 Describe the relative distance of objects in the solar system from earth.	**√0607.6.2** Construct a model of the solar system showing accurate positional relationships and relative distances.	**SPI 0607.6.2** Explain how the relative distance of objects from the earth affects how they appear.
GLE 0607.6.3 Explain how the positional relationships among the earth, moon, and sun control the length of the day, lunar cycle, and year.	**√0607.6.3** Investigate how the earth, sun, and moon are responsible for a day, lunar cycle, and year.	**SPI 0607.6.3** Distinguish among a day, lunar cycle, and year based on the movements of the earth, sun, and moon.
GLE 0607.6.4 Describe the different stages in the lunar cycle.	**√0607.6.4** Explain why the positions of the earth, moon, and sun were used to develop calendars and clocks.	**SPI 0607.6.4** Explain the different phases of the moon using a model of the earth, moon, and sun.
GLE 0607.6.5 Produce a model to demonstrate how the moon produces tides.	**√0607.6.5** Illustrate the positions of the earth, moon, and sun during specific tidal	**SPI 0607.6.5** Predict the types of tides that occur when the earth and moon occupy

GLE 0607.6.6 Illustrate the relationship between the seasons and the earth-sun system. **GLE 0607.6.7** Describe the causes of lunar and solar eclipses.	conditions. **√0607.6.6** Diagram the relationship of the earth and sun that accounts for the seasons. **0607.6.7** Model the positions of the earth, moon, and sun during solar and lunar eclipses.	various positions. **SPI 0607.6.6** Use a diagram that shows the positions of the earth and sun to explain the four seasons. **SPI 0607.6.7** Explain the difference between a solar and a lunar eclipse.

Grade 6 : 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	Checks for Understanding	State Performance Indicators
(NOT ADDRESSED AT THIS GRADE LEVEL)	**(NOT ADDRESSED AT THIS GRADE LEVEL)**	**(NOT ADDRESSED AT THIS GRADE LEVEL)**

Grade 6 : 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	Checks for Understanding	State Performance Indicators
GLE 0607.8.1 Design and conduct an investigation to determine how the sun drives atmospheric convection. **GLE 0607.8.2** Describe how the sun's energy produces the wind. **GLE 0607.8.3** Investigate the relationship between currents and oceanic temperature differences. **GLE 0607.8.4** Analyze meteorological data to predict weather conditions.	√**0607.8.1** Recognize how convection currents in the atmosphere produce wind. √**0607.8.2** Design an experiment to investigate differences in the amount of the sun's energy absorbed by a variety of surface materials. √**0607.8.3** Design an experiment to demonstrate how ocean currents are associated with the sun's energy. √**0607.8.4** Analyze ocean temperature data to demonstrate how these conditions affect the weather in nearby land masses. √**0607.8.5** Interpret data found on ocean current maps. √**0607.8.6** Use data collected from instruments such as a barometer, thermometer, psychrometer, and anemometer to describe local weather conditions.	**SPI 0607.8.1** Analyze data to identify events associated with heat convection in the atmosphere. **SPI 0607.8.2** Recognize the connection between the sun's energy and the wind. **SPI 0607.8.3** Describe how temperature differences in the ocean account for currents. **SPI 0607.8.4** Interpret meteorological data to make predictions about the weather.

7th GRADE

Grade 7 : 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	Checks for Understanding	State Performance Indicators
GLE 0707.Inq.1 Design and conduct open-ended scientific investigations. **GLE 0707.Inq.2** Use appropriate tools and techniques to gather, organize, analyze, and interpret data. **GLE 0707.Inq.3** Synthesize information to determine cause and effect relationships between evidence and explanations. **GLE 0707.Inq.4** Recognize possible sources of bias and error, alternative explanations, and questions for further exploration. **GLE 0707.Inq.5** Communicate scientific understanding using descriptions, explanations, and models.	√**0707.Inq.1** Design and conduct an open-ended scientific investigation to answer a question that includes a control and appropriate variables. √**0707.Inq.2** Identify tools and techniques needed to gather, organize, analyze, and interpret data collected from a moderately complex scientific investigation. √**0707.Inq.3** Use evidence from a dataset to determine cause and effect relationships that explain a phenomenon. √**0707.Inq.4** Review an experimental design to determine possible sources of bias or error, state alternative explanations, and identify questions for further investigation. √**0707.Inq.5** Design a method to explain the results of an investigation using descriptions, explanations, or models.	**SPI 0707.Inq.1** Design a simple experimental procedure with an identified control and appropriate variables. **SPI 0707.Inq.2** Select tools and procedures needed to conduct a moderately complex experiment. **SPI 0707.Inq.3** Interpret and translate data into a table, graph, or diagram. **SPI 0707.Inq.4** Draw a conclusion that establishes a cause and effect relationship supported by evidence. **SPI 0707.Inq.5** Identify a faulty interpretation of data that is due to bias or experimental error.

Grade 7 : 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	Checks for Understanding	State Performance Indicators
GLE 0707.T/E.1 Explore how technology responds to social, political, and economic needs. **GLE 0707.T/E.2** Know that the engineering design process involves an ongoing series of events that incorporate design constraints, model building, testing, evaluating, modifying, and retesting. **GLE 0707.T/E.3** Compare the intended benefits with the unintended consequences of a new technology. **GLE 0707.T/E.4** Describe and explain adaptive and assistive bioengineered products.	√**0707.T/E.1** Use appropriate tools to test for strength, hardness, and flexibility of materials. √**7707.T/E.2** Apply the engineering design process to construct a prototype that meets certain specifications. √**0707.T/E.3** Explore how the unintended consequences of new technologies can impact society. √**0707.T/E.4** Research bioengineering technologies that advance health and contribute to improvements in our daily lives. √**0707.T/E.5** Develop an adaptive design and test its effectiveness.	**SPI 0707.T/E.1** Identify the tools and procedures needed to test the design features of a prototype. **SPI 0707.T/E.2** Evaluate a protocol to determine if the engineering design process was successfully applied. **SPI 0707.T/E.3** Distinguish between the intended benefits and the unintended consequences of a new technology. **SPI 0707.T/E.4** Differentiate between adaptive and assistive bioengineered products (e.g., food, biofuels, medicines, integrated pest management).

Grade 7 - Earth and Space Science

Grade 7 : Standard 6 -The Universe

Conceptual Strand 6

The cosmos is vast and explored well enough to know its basic structure and operational principles.

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	Checks for Understanding	State Performance Indicators
(NOT ADDRESSED AT THIS GRADE LEVEL)	**(NOT ADDRESSED AT THIS GRADE LEVEL)**	**(NOT ADDRESSED AT THIS GRADE LEVEL)**

Grade 7 : 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	Checks for Understanding	State Performance Indicators
GLE 0707.7.1 Describe the physical properties of minerals. **GLE 0707.7.2** Summarize the basic events that occur during the rock cycle. **GLE 0707.7.3** Analyze the characteristics of the earth's layers and the location of the major plates. **GLE 0707.7.4** Explain how earthquakes, mountain building, volcanoes, and sea floor spreading are associated with movements of the earth's major plates. **GLE 0707.7.5** Differentiate between renewable and nonrenewable resources in terms of their use by man. **GLE 0707.7.6** Evaluate how human activities affect the earth's land, oceans, and atmosphere.	**√0707.7.1** Organize and explain information about the properties of minerals and their uses. **√0707.7.2** Label a diagram that depicts the major processes of the rock cycle. **√0707.7.3** Distinguish among sedimentary, igneous, and metamorphic rocks and relate these to a simple diagram of the rock cycle. **√0707.7.4** Recognize that the earth's layers have different thickness, states of matter, densities, and chemical makeup. **√0707.7.5** Analyze the relationship between plate movements and areas of earthquake activity. **√0707.7.6** Analyze the relationship between plate movements and mountain building.	**SPI 0707.7.1** Use a table of physical properties to classify minerals. **SPI 0707.7.2** Label a diagram that depicts the three different rock types. **SPI 0707.7.3** Identify the major processes that drive the rock cycle. **SPI 0707.7.4** Differentiate among the characteristics of the earth's three layers. **SPI 0707.7.5** Recognize that lithospheric plates on the scale of continents and oceans continually move at rates of centimeters per year. **SPI 0707.7.6** Describe the relationship between plate movements and earthquakes, mountain building, volcanoes, and sea floor spreading.

	√**0707.7.7** Analyze the relationship between plate movements, volcanoes, and sea floor spreading. √**0707.7.8** Determine the impact of man's use of renewable and nonrenewable resources on future supplies. √**0707.7.9** Evaluate how human activities affect the condition of the earth's land, water, and atmosphere.	**SPI 0707.7.7** Analyze and evaluate the impact of man's use of earth's land, water, and atmospheric resources.

Grade 7 : 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	Checks for Understanding	State Performance Indicators
(NOT ADDRESSED AT THIS GRADE LEVEL)	**(NOT ADDRESSED AT THIS GRADE LEVEL)**	**(NOT ADDRESSED AT THIS GRADE LEVEL)**

8th GRADE

Grade 8 : 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	Checks for Understanding	State Performance Indicators
GLE 0807.Inq.1 Design and conduct open-ended scientific investigations. **GLE 0807.Inq.2** Use appropriate tools and techniques to gather, organize, analyze, and interpret data. **GLE 0807.Inq.3** Synthesize information to determine cause and effect relationships between evidence and explanations. **GLE 0807.Inq.4** Recognize possible sources of bias and error, alternative explanations, and questions for further exploration. **GLE 0807.Inq.5** Communicate scientific understanding using descriptions, explanations, and models.	**√0807.Inq.1** Design and conduct an open-ended scientific investigation to answer a question that includes a control and appropriate variables. **√0807.Inq.2** Identify tools and techniques needed to gather, organize, analyze, and interpret data collected from a moderately complex scientific investigation. **√0807.Inq.3** Use evidence from a dataset to determine cause and effect relationships that explain a phenomenon. **√0807.Inq.4** Review an experimental design to determine possible sources of bias or error, state alternative explanations, and identify questions for further investigation. **√0807.Ing.5** Design a method to explain the results of an investigation using descriptions, explanations, or models.	**SPI 0807.Inq.1** Design a simple experimental procedure with an identified control and appropriate variables. **SPI 0807.Inq.2** Select tools and procedures needed to conduct a moderately complex experiment. **SPI 0807.Inq.3** Interpret and translate data into a table, graph, or diagram. **SPI 0807.Inq.4** Draw a conclusion that establishes a cause and effect relationship supported by evidence. **SPI 0807.Inq.5** Identify a faulty interpretation of data that is due to bias or experimental error.

Grade 8 : 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	Checks for Understanding	State Performance Indicators
GLE 0807.T/E.1 Explore how technology responds to social, political, and economic needs. **GLE 0807.T/E.2** Know that the engineering design process involves an ongoing series of events that incorporate design constraints, model building, testing, evaluating, modifying, and retesting. **GLE 0807.T/E.3** Compare the intended benefits with the unintended consequences of a new technology. **GLE 0807.T/E.4** Describe and explain adaptive and assistive bioengineered products.	√**0807.T/E.1** Use appropriate tools to test for strength, hardness, and flexibility of materials. √**7707.T/E.2** Apply the engineering design process to construct a prototype that meets certain specifications. √**0807.T/E.3** Explore how the unintended consequences of new technologies can impact society. √**0807.T/E.4** Research bioengineering technologies that advance health and contribute to improvements in our daily lives. √**0807.T/E.5** Develop an adaptive design and test its effectiveness.	**SPI 0807.T/E.1** Identify the tools and procedures needed to test the design features of a prototype. **SPI 0807.T/E.2** Evaluate a protocol to determine if the engineering design process was successfully applied. **SPI 0807.T/E.3** Distinguish between the intended benefits and the unintended consequences of a new technology. **SPI 0807.T/E.4** Differentiate between adaptive and assistive bioengineered products (e.g., food, biofuels, medicines, integrated pest management).

Grade 8 - Earth and Space Science

Grade 8 : Standard 6 -The Universe

Conceptual Strand 6

The cosmos is vast and explored well enough to know its basic structure and operational principles.

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	Checks for Understanding	State Performance Indicators
(NOT ADDRESSED AT THIS GRADE LEVEL)	**(NOT ADDRESSED AT THIS GRADE LEVEL)**	**(NOT ADDRESSED AT THIS GRADE LEVEL)**

Grade 8 : 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	Checks for Understanding	State Performance Indicators
(NOT ADDRESSED AT THIS GRADE LEVEL)	**(NOT ADDRESSED AT THIS GRADE LEVEL)**	**(NOT ADDRESSED AT THIS GRADE LEVEL)**

Grade 8 : 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	Checks for Understanding	State Performance Indicators
(NOT ADDRESSED AT THIS GRADE LEVEL)	**(NOT ADDRESSED AT THIS GRADE LEVEL)**	**(NOT ADDRESSED AT THIS GRADE LEVEL)**