

## Grade 6 : Embedded Inquiry

### Conceptual Strand

*Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21<sup>st</sup> century.*

### Guiding Question

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

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

	for further investigation.  ✓ <b>0607.Inq.5</b> Design a method to explain the results of an investigation using descriptions, explanations, or models.	
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## 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
<p><b>GLE 0607.T/E.1</b> Explore how technology responds to social, political, and economic needs.</p> <p><b>GLE 0607.T/E.2</b> Know that the engineering design process involves an ongoing series of events that incorporate design constraints, model building, testing, evaluating, modifying, and retesting.</p> <p><b>GLE 0607.T/E.3</b> Compare the intended benefits with the unintended consequences of a new</p>	<p>✓<b>0607.T/E.1</b> Use appropriate tools to test for strength, hardness, and flexibility of materials.</p> <p>✓<b>0607.T/E.2</b> Apply the engineering design process to construct a prototype that meets certain specifications.</p> <p>✓<b>0607.T/E.3</b> Explore how the unintended consequences of new technologies can impact society.</p>	<p><b>SPI 0607.T/E.1</b> Identify the tools and procedures needed to test the design features of a prototype.</p> <p><b>SPI 0607.T/E.2</b> Evaluate a protocol to determine if the engineering design process was successfully applied.</p> <p><b>SPI 0607.T/E.3</b> Distinguish between the intended benefits and the unintended consequences of a new technology.</p>

<p>technology.</p> <p><b>GLE 0607.T/E.4</b> Describe and explain adaptive and assistive bioengineered products.</p>	<p>✓<b>0607.T/E.4</b> Research bioengineering technologies that advance health and contribute to improvements in our daily lives.</p> <p>✓<b>0607.T/E.5</b> Develop an adaptive design and test its effectiveness.</p>	<p><b>SPI 0607.T/E.4</b> Differentiate between adaptive and assistive engineered products (e.g., food, biofuels, medicines, integrated pest management).</p>
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## Grade 6 - Life Science

### Grade 6 : 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?*

<b>Grade Level Expectations</b>	<b>Checks for Understanding</b>	<b>State Performance Indicators</b>
<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>

## Grade 6 : 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	Checks for Understanding	State Performance Indicators
<p><b>GLE 0607.2.1</b> Examine the roles of consumers, producers, and decomposers in a biological community.</p> <p><b>GLE 0607.2.2</b> Describe how matter and energy are transferred through an ecosystem.</p> <p><b>GLE 0607.2.3</b> Draw conclusions from data about interactions between the biotic and abiotic elements of a particular environment.</p> <p><b>GLE 0607.2.4</b> Analyze the environments and the interdependence among organisms found in the world's major biomes.</p>	<p>✓<b>0607.2.1</b> Compare and contrast the different methods used by organisms to obtain nutrition in a biological community.</p> <p>✓<b>0607.2.2</b> Create a graphic organizer that illustrates how biotic and abiotic elements of an environment interact.</p> <p>✓<b>0607.2.3</b> Use a food web or energy pyramid to demonstrate the interdependence of organisms within a specific biome.</p> <p>✓<b>0607.2.4</b> Create poster presentations to illustrate differences among the world's major biomes.</p>	<p><b>SPI 0607.2.1</b> Classify organisms as producers, consumers, scavengers, or decomposers according to their role in a food chain or food web.</p> <p><b>SPI 0607.2.2</b> Interpret how materials and energy are transferred through an ecosystem.</p> <p><b>SPI 0607.2.3</b> Identify the biotic and abiotic elements of the major biomes.</p> <p><b>SPI 0607.2.4</b> Identify the environmental conditions and interdependencies among organisms found in the major biomes.</p>

## Grade 6 : Standard 3 - Flow of Matter and Energy

<b>Conceptual Strand 3</b> <i>Matter and energy flow through the biosphere.</i>		
<b>Guiding Question 3</b> <i>What scientific information explains how matter and energy flow through the biosphere?</i>		
<b>Grade Level Expectations</b>	<b>Checks for Understanding</b>	<b>State Performance Indicators</b>
<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>

<b>Grade 6 : Standard 4 - Heredity</b>		
<b>Conceptual Strand 4</b> <i>Plants and animals reproduce and transmit hereditary information between generations.</i>		
<b>Guiding Question 4</b> <i>What are the principal mechanisms by which living things reproduce and transmit information between parents and offspring?</i>		
<b>Grade Level Expectations</b>	<b>Checks for Understanding</b>	<b>State Performance Indicators</b>
<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>

## Grade 6 : Standard 5 - Biodiversity and Change

### Conceptual Strand 5

*A rich variety of complex organisms have developed in response to a continually changing environment.*

### Guiding Question 5

*How does natural selection explain how organisms have changed over time?*

Grade Level Expectations	Checks for Understanding	State Performance Indicators
<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>

## 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?*

<b>Grade Level Expectations</b>	<b>Checks for Understanding</b>	<b>State Performance Indicators</b>
<p><b>GLE 0607.6.1</b> Analyze information about the major components of the universe.</p> <p><b>GLE 0607.6.2</b> Describe the relative distance of objects in the solar system from earth.</p> <p><b>GLE 0607.6.3</b> Explain how the positional relationships among the earth, moon, and sun control the length of the day, lunar cycle, and year.</p> <p><b>GLE 0607.6.4</b> Describe the different stages in the lunar cycle.</p> <p><b>GLE 0607.6.5</b> Produce a model to demonstrate how the moon produces tides.</p> <p><b>GLE 0607.6.6</b> Illustrate the relationship between the seasons and the earth-sun system.</p> <p><b>GLE 0607.6.7</b> Describe the causes of lunar and solar eclipses.</p>	<p>✓<b>0607.6.1</b> Use data to draw conclusions about the major components of the universe.</p> <p>✓<b>0607.6.2</b> Construct a model of the solar system showing accurate positional relationships and relative distances.</p> <p>✓<b>0607.6.3</b> Investigate how the earth, sun, and moon are responsible for a day, lunar cycle, and year.</p> <p>✓<b>0607.6.4</b> Explain why the positions of the earth, moon, and sun were used to develop calendars and clocks.</p> <p>✓<b>0607.6.5</b> Illustrate the positions of the earth, moon, and sun during specific tidal conditions.</p> <p>✓<b>0607.6.6</b> Diagram the relationship of the earth and sun that accounts for the seasons.</p> <p>✓<b>0607.6.7</b> Model the positions of the earth, moon, and sun during solar and lunar eclipses.</p>	<p><b>SPI 0607.6.1</b> Use data to draw conclusions about the major components of the universe.</p> <p><b>SPI 0607.6.2</b> Explain how the relative distance of objects from the earth affects how they appear.</p> <p><b>SPI 0607.6.3</b> Distinguish among a day, lunar cycle, and year based on the movements of the earth, sun, and moon.</p> <p><b>SPI 0607.6.4</b> Explain the different phases of the moon using a model of the earth, moon, and sun.</p> <p><b>SPI 0607.6.5</b> Predict the types of tides that occur when the earth and moon occupy various positions.</p> <p><b>SPI 0607.6.6</b> Use a diagram that shows the positions of the earth and sun to explain the four seasons.</p> <p><b>SPI 0607.6.7</b> Explain the difference between a solar and a lunar eclipse.</p>

## 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?*

<b>Grade Level Expectations</b>	<b>Checks for Understanding</b>	<b>State Performance Indicators</b>
<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>

## 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?*

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

### Grade 6 : Standard 9 - Matter

<b>Conceptual Strand 9</b> <i>The composition and structure of matter is known, and it behaves according to principles that are generally understood.</i>		
<b>Guiding Question 9</b> <i>How does the structure of matter influence its physical and chemical behavior?</i>		
<b>Grade Level Expectations</b>	<b>Checks for Understanding</b>	<b>State Performance Indicators</b>
<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>

<b>Grade 6 : Standard 10 - Energy</b>		
<b>Conceptual Strand 10</b> <i>Various forms of energy are constantly being transformed into other types without any net loss of energy from the system.</i>		
<b>Guiding Question 10</b> <i>What basic energy related ideas are essential for understanding the dependency of the natural and man-made worlds on energy?</i>		
<b>Grade Level Expectations</b>	<b>Checks for Understanding</b>	<b>State Performance Indicators</b>
GLE 0607.10.1 Compare and contrast the three forms of potential energy.  GLE 0607.10.2 Analyze various types of energy	✓0607.10.1 Compare potential and kinetic energy.  ✓0607.10.2 Create a poster that illustrates	SPI 0607.10.1 Distinguish among gravitational potential energy, elastic potential energy, and chemical potential energy.

transformations. <b>GLE 0607.10.3</b> Explain the principles underlying the Law of Conservation of Energy.	different forms of potential energy. <b>✓0607.10.3</b> Design a model that demonstrates a specific energy transformation. <b>✓0607.10.4</b> Explain why a variety of energy transformations illustrate the Law of Conservation of Energy.	<b>SPI 0607.10.2</b> Interpret the relationship between potential and kinetic energy. <b>SPI 0607.10.3</b> Recognize that energy can be transformed from one type to another. <b>SPI 0607.10.4</b> Explain the Law of Conservation of Energy using data from a variety of energy transformations.
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## Grade 6 : 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	Checks for Understanding	State Performance Indicators
<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>	<u>(NOT ADDRESSED AT THIS GRADE LEVEL)</u>

## Grade 6: 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?*

<b>Grade Level Expectations</b>	<b>Checks for Understanding</b>	<b>State Performance Indicators</b>
<p><b>GLE 0607.12.1</b> Describe how simple circuits are associated with the transfer of electrical energy.</p> <p><b>GLE 0607.12.2</b> Explain how simple electrical circuits can be used to determine which materials conduct electricity.</p>	<p>✓<b>0607.12.1</b> Prepare a poster that illustrates how electricity passes through a simple circuit to produce heat, light, or sound.</p> <p>✓<b>0607.12.2</b> Determine a material's electrical conductivity by testing it with a simple battery/bulb circuit.</p> <p>✓<b>0607.12.3</b> Compare and contrast the characteristics of objects and materials that conduct electricity with those that are electrical insulators.</p>	<p><b>SPI 0607.12.1</b> Identify how simple circuits are associated with the transfer of electrical energy when heat, light, sound, and chemical changes are produced.</p> <p><b>SPI 0607.12.2</b> Identify materials that can conduct electricity.</p>