SIXTH GRADE STANDARDS					
Standard	Conceptual Strand	Guiding Question	Grade Level Expectations	Checks for Understanding	State Performance Indicators
2. Interdependence	All life is interdependent and interacts with the environment.	How do living things interact with one another and with the non-living elements of their environment?	1. Examine the roles of consumers, producers, and decomposers in a biological community. 2. Describe how matter and energy are transferred through an ecosystem. 3. Draw conclusions from data about interactions between the biotic and abiotic elements of a particular environment. 4. Analyze the environments and the interdependence among organisms found in the world's major biomes.	1. Compare and contrast the different methods used by organisms to obtain nutrition in a biological community. 2. Create a graphic organizer that illustrates how biotic and abiotic elements of an environment interact. 3. Use a food web or energy pyramid to demonstrate the interdependence of organisms within a specific biome. 4. Create poster presentations to illustrate differences among the world's major biomes.	1. Classify organisms as producers, consumers, scavengers, or decomposers according to their role in a food chain or food web. 2. Interpret how materials and energy are transferred through an ecosystem. 3. Identify the biotic and abiotic elements of the major biomes. 4. Identify the environmental conditions and interdependencies among organisms found in the major biomes.
6. The Universe	The cosmos is vast and explored well enough to know its basic structure and operational principles.	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?	1. Analyze information about the major components of the universe. 2. Describe the relative distance of objects in the solar system from earth. 3. Explain how the positional relationships among the earth, moon, and sun control the length of the day, lunar cycle, and year. 4. Describe the different stages in the lunar cycle. 5. Produce a model to demonstrate how the moon produces tides. 6. Illustrate the relationship between the seasons and the earth-sun system. 7. Describe the causes of lunar and solar eclipses.	1. Use data to draw conclusions about the major components of the universe. 2. Construct a model of the solar system showing accurate positional relationships and relative distances. 3. Investigate how the earth, sun, and moon are responsible for a day, lunar cycle, and year. 4. Explain why the positions of the earth, moon, and sun were used to develop calendars and clocks. 5. Illustrate the positions of the earth, moon, and sun during specific tidal conditions. 6. Diagram the relationship of the earth and sun that accounts for the seasons. 7. Model the positions of the earth, moon, and sun during solar and lunar eclipses.	1. Use data to draw conclusions about the major components of the universe. 2. Explain how the relative distance of objects from the earth affects how they appear. 3. Distinguish among a day, lunar cycle, and year based on the movements of the earth, sun, and moon. 4. Explain the different phases of the moon using a model of the earth, moon, and sun. 5. Predict the types of tides that occur when the earth and moon occupy various positions. 6. Use a diagram that shows the positions of the earth and sun to explain the four seasons. 7. Explain the difference between a solar and a lunar eclipse.
8. The Atmosphere	The earth is surrounded by an active atmosphere and an energy system that controls the distribution of life, local weather, climate, and global temperature.	How do the physical characteristics and the chemical makeup of the atmosphere influence surface processes and life on Earth?	1. Design and conduct an investigation to determine how the sun drives atmospheric convection. 2. Describe how the sun's energy produces the wind. 3. Investigate the relationship between currents and oceanic temperature differences. 4. Analyze meteorological data to predict weather conditions.	1. Recognize how convection currents in the atmosphere produce wind. 2. Design an experiment to investigate differences in the amount of the sun's energy absorbed by a variety of surface materials. 3. Design an experiment to demonstrate how ocean currents are associated with the sun's energy. 4. Analyze ocean temperature data to demonstrate how these conditions affect the weather in nearby land masses. 5. Interpret data found on ocean current maps. 6. Use data collected from instruments such as a barometer, thermometer, psychrometer, and anemometer to describe local weather conditions.	1. Analyze data to identify events associated with heat convection in the atmosphere. 2. Recognize the connection between the sun's energy and the wind. 3. Describe how temperature differences in the ocean account for currents. 4. Interpret meteorological data to make predictions about the weather.
10. Energy	Various forms of energy are constantly being transformed into other types without any net loss of energy from the system.	What basic energy related ideas are essential for understanding the dependency of the natural and human-made worlds on energy?	1. Compare and contrast the three forms of potential energy. 2. Analyze various types of energytransformations. 3. Explain the principles underlying the Law of Conservation of Energy.	1. Compare potential and kinetic energy. 2. Create a poster that illustratesdifferent forms of potential energy. 3. Design a model that demonstrates a specific energy transformation. 4. Explain why a variety of energy transformations illustrate the Law of Conservation of Energy.	1. Distinguish among gravitational potential energy, elastic potential energy, and chemical potential energy. 2. Interpret the relationship between potential and kinetic energy. 3. Recognize that energy can be transformed from one type to another. 4. Explain the Law of Conservation of Energy using data from a variety of energy transformations.
12. Forces in Nature	Everything in the universe exerts a gravitational force on everything else; there is an interplay between magnetic fields and electrical currents.	What are the scientific principles that explain gravity and electromagnetism?	1. Describe how simple circuits are associated with the transfer of electrical energy. 2. Explain how simple electrical circuits can be used to determine which materials. conduct electricity.	1. Prepare a poster that illustrates how electricity passes though a simple circuit to produce heat, light, or sound. 2. Determine a material's electrical conductivity by testing it with a simple battery/bulb circuit. 3. Compare and contrast the characteristics of objects and materials that conduct electricity with those that are electrical insulators.	1. Identify how simple circuits are associated with the transfer of electrical energy when heat, light, sound, and chemical changes are produced. 2. Identify materials that can conduct electricity.
Embedded Inquiry	Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21st century.	What tools, skills, knowledge, and dispositions are needed to conduct scientific inquiry?	1.Design and conduct open-ended scientific investigations. 2. Use appropriate tools and techniques to gather, organize, analyze, and interpret data. 3. Synthesize information to determine cause and effect relationships between evidence and explanations. 4. Recognize possible sources of bias and error, alternative explanations, and questions for further exploration. 5. Communicate scientific understanding using descriptions, explanations, and models.	1. Design and conduct an open-ended scientific investigation to answer a question that includes a control and appropriate variables. 2. Identify tools and techniques needed to gather, organize, analyze, and interpret data collected from a moderately complex scientific investigation. 3. Use evidence from a dataset to determine cause and effect relationships that explain a phenomenon. 4. Review an experimental design to determine possible sources of bias or error, state alternative explanations, and identify questions	1. Design a simple experimental procedure with an identified control and appropriate variables. 2. Select tools and procedures needed to conduct a moderately complex experiment. 3. Interpret and translate data in a table, graph, or diagram. 4. Draw a conclusion that establishes a cause and effect relationship supported by evidence. 5. Identify a faulty interpretation of data that is due to bias or experimental error.
Embedded Technology and Engineering	Society benefits when engineers apply scientific discoveries to design materials and processes that develop into enabling technologies.	How do science concepts, engineering skills, and applications of technology improve the quality of life?	1. Explore how technology responds to social, political, and economic needs. 2. Know that the engineering design process involves an ongoing series of events that incorporate design constraints, model building, testing, evaluating, modifying, and retesting. 3. Compare the intended benefits with the unintended consequences of a new technology. 4. Describe and explain adaptive and assistive bioengineered products.	1. Use appropriate tools to test for strength, hardness, and flexibility of materials. 2. Apply the engineering design process to construct a prototype that meets certain specifications. 3. Explore how the unintended consequences of new technologies can impact society. 4. Research bioengineering technologies that advance health and contribute to improvements in our daily lives. 5. Develop an adaptive design and test its effectiveness.	1. Identify the tools and procedures needed to test the design features of a prototype. 2. Evaluate a protocol to determine if the engineering design process was successfully applied. 3. Distinguish between the intended benefits and the unintended consequences of a new technology. 4. Differentiate between adaptive and assistive engineered products (e.g., food, biofuels, medicines, integrated pest management).