Standard | Conceptual Strand | Guiding Question | Grade Level Expectations | Checks for Understanding
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1. Cells | All living things are made of cells that perform functions necessary for life. | How are plant and animal cells organized to carry on the processes of life? | Recognize that many things are made of smaller parts. | 1. Use puzzles to determine that there are many parts that make up a whole. 2. Build models to create a whole from the parts. 3. Take apart an object and describe how the parts work together.
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. Recognize that some things are living and some are not. 2. Know that people interact with their environment through their senses. | 1. Categorize objects or images of objects as living or non-living according to their characteristics. 2. Use the senses to investigate and describe an object.
3. Flow of Matter & Energy | Matter and energy flow through the biosphere. | What scientific information explains how matter and energy flow through the biosphere? | Recognize that living things require water, food, and air. | 1. Observe and record daily weather data during different seasons. 2. Match pictures of seedlings to adult plants and a juvenile to the adult animal.
4. Heredity | Plants and animals reproduce and transmit hereditary information between generations. | What are the principal mechanisms by which living things reproduce and transmit information between parents and offspring? | 1. Observe how plants and animals change as they grow. 2. Observe that offspring resemble their parents. | 1. Observe plants and animals and make records of their similarities and differences. 2. Record information about the care, feeding, and maintenance of a living thing.
5. Biodegradability & Change | A rich variety of complex organisms have developed in response to a continually changing environment. | How does natural selection explain how organisms have changed over time? | Compare the basic features of plants and animals. | 1. Use a variety of representations to describe similarities and differences among plants and animals. 2. Create a model of an ecosystem and compare the characteristics of plants and animals within that environment. 3. Match pictures of animal and plant characteristics needed for survival to appropriate environments.
6. The Universe | The universe 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? | Know the different objects that are visible in the day and night sky. | 1. Create a Venn diagram to compare the objects that can be seen in the day and night sky. 2. Observe, discuss, and draw objects found in the day and night sky.
7. The Earth | 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? | Collect daily weather data at different times of the year. | 1. Collect, compare, and record daily weather data during different seasons. 2. Infer the relationship between temperature and seasonal change by maintaining a paper chart on which dates are recorded and temperature described according to different colors.
8. Matter | The composition and structure of matter is known, and it behaves according to principles that are generally understood. | How does the structure of matter influence its physical and chemical behavior? | 1. Describe an object by its observable properties. 2. Observe objects and materials as solids or liquids. | 1. Identify non-living materials found on the school site and discuss how these materials are similar and different. 2. Investigate and compare a variety of non-living materials using simple tools. 3. Observe familiar environments and make lists of natural and man-made objects.
9. 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. Identify the sun as the source of heat and light. 2. Investigate the effect of the sun on a variety of materials. | 1. Collect, compare, and record daily weather data during different seasons. 2. Infer the relationship between temperature and seasonal change by maintaining a paper chart on which dates are recorded and temperature described according to different colors.
10. Energy | Objects move in ways that can be observed, described, predicted, and measured. | What causes objects to move differently under different circumstances? | Explore different ways that objects move. | Use a variety of objects to demonstrate different types of movement. (e.g., straight line/moving, backwards/forward, side to side, in circles, fast/slow).
11. Motion | 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. Observe the world of familiar objects using the senses and tools. 2. Ask questions, make logical predictions, plan investigations, and represent data. 3. Explain the data from an investigation. | 1. Use senses and simple tools to make observations. 2. Communicate interest in simple phenomena and plan for simple investigations. 3. Communicate understanding of simple data using appropriate vocabulary. 4. Collect, discuss, and communicate findings from a variety of investigations.
Embedded Inquiry | 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? | Recognize that both natural materials and human-made tools have specific characteristics that determine their uses. | 1. Explain how simple tools are used to extend the senses, make life easier, and solve everyday problems. 2. Invent designs for simple problems. 3. Use the tools to measure materials and construct simple products.
Embedded Engineering | Technology and processes that develop into enabling technologies. | How do science concepts, engineering skills, and applications of technology improve the quality of life? | Recognize that both natural materials and human-made tools have specific characteristics that determine their uses. | 1. Explain how simple tools are used to extend the senses, make life easier, and solve everyday problems. 2. Invent designs for simple problems. 3. Use the tools to measure materials and construct simple products.