

## Subject - Science: Science

### Grade - 4: Grade 4

#### Section - 4.Intro: Introduction

**Non-Specific Strand - 4.Intro.1: In Grade 4, investigations are used to learn about the natural world. Students should understand that certain types of questions can be answered by investigations and that methods, models, and conclusions built from these investigations change as new observations are made. Models of objects and events are tools for understanding the natural world and can show how systems work. They have limitations and, based on new discoveries, are constantly being modified to more closely reflect the natural world.**

#### **Non-Specific Strand Division**

- **4.Intro.1A:** Within the physical environment, students know about the physical properties of matter including mass, volume, states of matter, temperature, magnetism, and the ability to sink or float. Students will differentiate among forms of energy including mechanical, light, sound, and thermal energy. Students will explore electrical circuits and design descriptive investigations to explore the effect of force on objects.
- **4.Intro.1B:** Within the natural environment, students know that earth materials have properties that are constantly changing due to Earth's forces. The students learn that the natural world consists of resources, including renewable and nonrenewable, and their responsibility to conserve our natural resources for future generations. They will also explore Sun, Earth, and Moon relationships. The students will recognize that our major source of energy is the Sun.
- **4.Intro.1C:** Within the living environment, students know and understand that living organisms within an ecosystem interact with one another and with their environment. The students will recognize that plants and animals have basic needs, and they are met through a flow of energy known as food webs. Students will explore how all living organisms go through a life cycle and have structures that enable organisms to survive in their ecosystem.

#### **Non-Specific Strand**

- **4.Intro.2:** Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process."
- **4.Intro.3:** Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include patterns, cycles, systems, models, and change and constancy.
- **4.Intro.4:** The study of elementary science includes planning and safely implementing classroom and outdoor investigations using scientific processes, including inquiry methods, analyzing information, making informed decisions, and using tools to collect and record information, while addressing the major concepts and vocabulary, in the context of physical, earth, and life sciences. Districts are encouraged to facilitate classroom and outdoor investigations for at least 50% of instructional time.
- **4.Intro.5:** Statements containing the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

#### Section - 4: Knowledge and Skills

##### Strand - 4: Scientific investigation and reasoning

**Knowledge & Skill Statement - 4.1: The student conducts classroom and outdoor investigations, following home and school safety procedures and environmentally appropriate and ethical practices. The student is expected to:**

#### **Student Expectation**

- **4.1A:** Demonstrate safe practices and the use of safety equipment as described in Texas Education Agency-approved safety standards during classroom and outdoor investigations using safety equipment, including safety goggles or chemical splash goggles, as appropriate, and gloves, as appropriate.
- **4.1B:** Make informed choices in the use and conservation of natural resources and reusing and recycling of materials such as paper, aluminum, glass, cans, and plastic.

**Knowledge & Skill Statement - 4.2: The student uses scientific practices during laboratory and outdoor investigations. The student is expected to:**

#### **Student Expectation**

- **4.2A:** Plan and implement descriptive investigations, including asking well defined questions, making inferences, and selecting and using appropriate equipment or technology to answer his/her questions.
- **4.2B:** Collect and record data by observing and measuring, using the metric system, and using descriptive words and numerals such as labeled drawings, writing, and concept maps.
- **4.2C:** Construct simple tables, charts, bar graphs, and maps using tools and current technology to organize, examine, and evaluate data.
- **4.2D:** Analyze data and interpret patterns to construct reasonable explanations from data that can be observed and measured.
- **4.2E:** Perform repeated investigations to increase the reliability of results.
- **4.2F:** Communicate valid oral and written results supported by data.

**Knowledge & Skill Statement - 4.3: The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to:**

### **Student Expectation**

- [4.3A: Analyze, evaluate, and critique scientific explanations by using evidence, logical reasoning, and experimental and observational testing.](#)
- [4.3B: Represent the natural world using models such as the water cycle and stream tables and identify their limitations, including accuracy and size.](#)
- [4.3C: Connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists.](#)

**Knowledge & Skill Statement - 4.4: The student knows how to use a variety of tools, materials, equipment, and models to conduct science inquiry. The student is expected to:**

### **Student Expectation**

- [4.4A: Collect, record, and analyze information using tools, including calculators, microscopes, cameras, computers, hand lenses, metric rulers, Celsius thermometers, mirrors, spring scales, balances, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, and notebooks; timing devices; and materials to support observation of habitats of organisms such as terrariums and aquariums.](#)

### **Strand - 4: Matter and energy.**

**Knowledge & Skill Statement - 4.5: The student knows that matter has measurable physical properties and those properties determine how matter is classified, changed, and used. The student is expected to:**

### **Student Expectation**

- [4.5A: Measure, compare, and contrast physical properties of matter, including mass, volume, states \(solid, liquid, gas\), temperature, magnetism, and the ability to sink or float.](#)
- [4.5B: Compare and contrast a variety of mixtures, including solutions.](#)

### **Strand - 4: Force, motion, and energy.**

**Knowledge & Skill Statement - 4.6: The student knows that energy exists in many forms and can be observed in cycles, patterns, and systems. The student is expected to:**

### **Student Expectation**

- [4.6A: Differentiate among forms of energy, including mechanical, sound, electrical, light, and thermal.](#)
- [4.6B: Differentiate between conductors and insulators of thermal and electrical energy.](#)
- [4.6C: Demonstrate that electricity travels in a closed path, creating an electrical circuit.](#)
- [4.6D: Design a descriptive investigation to explore the effect of force on an object such as a push or a pull, gravity, friction, or magnetism.](#)

### **Strand - 4: Earth and space**

**Knowledge & Skill Statement - 4.7: The students know that Earth consists of useful resources and its surface is constantly changing. The student is expected to:**

### **Student Expectation**

- [4.7A: Examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants.](#)
- [4.7B: Observe and identify slow changes to Earth's surface caused by weathering, erosion, and deposition from water, wind, and ice.](#)
- [4.7C: Identify and classify Earth's renewable resources, including air, plants, water, and animals, and nonrenewable resources, including coal, oil, and natural gas, and the importance of conservation.](#)

**Knowledge & Skill Statement - 4.8: The student knows that there are recognizable patterns in the natural world and among the Sun, Earth, and Moon system. The student is expected to:**

### **Student Expectation**

- [4.8A: Measure, record, and predict changes in weather.](#)
- [4.8B: Describe and illustrate the continuous movement of water above and on the surface of Earth through the water cycle and explain the role of the Sun as a major source of energy in this process.](#)
- [4.8C: Collect and analyze data to identify sequences and predict patterns of change in shadows, seasons, and the observable appearance of the Moon over time.](#)

### **Strand - 4: Organisms and environments**

**Knowledge & Skill Statement - 4.9: The student knows and understands that living organisms within an ecosystem interact with one another and with their environment. The student is expected**

to:

#### **Student Expectation**

- 4.9A: Investigate that most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food.
- 4.9B: Describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web.

**Knowledge & Skill Statement - 4.10: The student knows that organisms undergo similar life processes and have structures and behaviors that help them survive within their environment. The student is expected to:**

#### **Student Expectation**

- 4.10A: Explore how structures and functions enable organisms to survive in their environment.
- 4.10B: Explore and describe examples of traits that are inherited from parents to offspring such as eye color and shapes of leaves and behaviors that are learned such as reading a book and a wolf pack teaching their pups to hunt effectively.
- 4.10C: Explore, illustrate, and compare life cycles in living organisms such as beetles, crickets, radishes, or lima beans.