

**Curriculum at a Glance**  
**Elementary Science K-5**

**Description:**

Elementary and middle school science curricula are based upon an inquiry model, each unit presents lessons related to students' experiences that encourage them to formulate their own questions for investigation and devise ways to answer them.

<b>Kindergarten</b>	
<b>Unit Name</b>	<b>Content</b>
<b>Properties of Matter Properties of Objects</b>	Use their senses and simple measuring tools to observe objects and classify them into groups based on size, weight, shape, and color Sort objects into groups based on texture, flexibility, magnetism, and buoyancy Count, compare, and describe quantitative relationships between groups of objects
<b>Heredity and Evolution Characteristics of Living Things</b>	Describe similarities and differences in the appearance and behaviors of plants, birds, fish, insects and mammals (including humans) Describe similarities and differences in the appearance and behaviors of adults and their offspring Distinguish living from non-living things
<b>Energy in the Earth's System Weather Patterns</b>	Draw conclusions based on observations, descriptions and records of daily weather conditions Compare and contrast the different weather conditions that occur in each season Relate changes in seasonal weather patterns to appropriate choices of clothing and activities
<b>Science and Technology Shelters</b>	Describe different types of shelters used by humans. Describe the types of materials used by people to build houses and the properties that make the materials useful (natural, man-made)

**Grade 1**

<b>Unit Name</b>	<b>Content</b>
<b>Force and Motion</b>	Describe how the motion of objects can be changed by pushing and pulling Describe the movement of the sun across the sky and the changes in the length and direction of shadows during the day Classify objects according to their properties
<b>Structure and Function Part 1</b>	Investigate and describe the different ways that animals, including humans, obtain water and food. Investigate and describe the different structures plants have for obtaining water and sunlight. Investigate and describe the structures that animals, including humans, use to move around
<b>Structure and Function Part 2</b>	Make observations, ask questions and make predictions about the changes in organisms as they undergo metamorphosis Seek information in books, magazines and other resources to make observations about the life cycles of organisms that grow, but do not metamorphose
<b>Science and Technology in Society</b>	Use various tools to estimate, measure, compare and contrast the sizes and weights of different objects and organisms Use standard and metric tools to measure materials and objects

**Grade 2**

<b>Unit Name</b>	<b>Content</b>
<b>Properties of Matter</b>	Compare and contrast the properties that distinguish solids, liquids and gases Classify objects and materials according to their state of matter Measure and compare the sizes of different solids Measure and compare the volume of a liquid poured into different containers Design a fair test to compare the flow rates of different liquids and granular solids
<b>Structure and Function- Plants</b>	Use senses and simple tools to observe and describe the roots, stems, leaves, flowers and seeds of various plants (including trees, vegetables and grass.) Use magnifiers to observe and diagram the parts of a flower Describe the functions of roots, stems, leaves, flowers and seeds in completing a plant's life cycle Record observations and make conclusions about the sequence of stages in a flowering plant's life cycle Compare and contrast how seeds of different plants are adapted for dispersal by water, wind or animals Conduct a fair test to explore factors that affect seed germination and plant growth
<b>The Changing Earth- Soil</b>	Use senses and simple tools (e.g., sieves and beakers) to separate soil into components such as rock fragments, water, air and plant remains Classify soils by properties such as color, particle size (sand, silt or clay), or amount of organic material (loam) Explain the importance of soil to plants, animals and people Evaluate the quality of different soils in terms of observable presence of air, water, living things and plant remains Conduct fair tests to investigate how different soil types affect plant growth, and write conclusions supported by evidence.
<b>Nutrition</b>	Explain that food is a source of carbohydrates, proteins and fats — nutrients that animals (including humans) convert to energy they use to stay alive and grow Classify foods into groups based on their source, and relate common foods to the plant or animal from which they come Give examples of ways people can improve soil quality and crop growth (e.g., irrigation, fertilizer, pest control) Compare and contrast how different cultures meet needs for basic nutrients by consuming various foods Evaluate the nutritional value of different foods by analyzing package labels

### Grade 3

Unit Name	Content
<b>Properties of Matter</b>	<p>Compare and contrast the properties of solids, liquids and gases</p> <p>Demonstrate that solids, liquids and gases are all forms of matter that take up space and have weight</p> <p>Students will carry out simple tests to determine if the properties of materials sink or float, conduct heat; or attract to magnets</p> <p>Classify materials based on their observable properties, including state of matter</p> <p>Design and conduct fair tests to investigate the absorbcency of different materials, write conclusions based on evidence, and analyze why similar investigations might produce different results</p> <p>Explain the role of heating and cooling in changing matter from one state to another during freezing, melting, evaporation and condensation</p>
<b>Heredity and Evolution</b>	<p>Compare and contrast the external features and behaviors that enable different animals and plants (including those that are extinct) to get food, water and sunlight; find mates; and be protected in specific land and water habitats</p> <p>Explain how behaviors such as hibernation, dormancy and migration give species advantages for surviving unfavorable environmental conditions.</p> <p>Explain ways animals benefit from camouflage</p> <p>Evaluate whether an adaptation gives a plant or animal a survival advantage in a given environment</p> <p>Design a model of an organism whose adaptations give it an advantage in a specific environment</p>
<b>The Changing Earth</b>	<p>Differentiate between rocks and minerals.</p> <p>Use senses and simple measuring tools to gather data about various rocks and classify them based on observable properties (e.g., shape, size, color, weight, visible markings).</p> <p>Conduct simple tests to determine properties of different minerals (e.g. color, odor, streak, luster, hardness, magnetism), organize data in a table, and use the data and other resources to identify unknown mineral specimens.</p> <p>Summarize nonfiction text to compare and contrast the conditions under which igneous, metamorphic and sedimentary rocks are formed.</p> <p>Observe and analyze rock properties (e.g., crystal size or layers) to infer the conditions under which the rock was formed.</p> <p>Evaluate the usefulness of different rock types for specific applications (e.g., buildings, sidewalks, stone walls, statues or monuments).</p>
<b>Science and Technology in Society</b>	<p>Describe ways people use earth materials, such as fossil fuels, trees, water, soils and rocks as natural resources to improve their lives</p> <p>Summarize nonfiction text to explain how humans use technology to access and use natural resources to produce electricity or other products (e.g.; paper or concrete)</p>

<p>Explain advantages and disadvantages of renewable and nonrenewable energy sources that can be used for making electricity, fueling cars or heating homes</p> <p>Design and conduct experiments to evaluate the effectiveness of different insulating materials for keeping a substance warm or cold (i.e., conducting heat)</p> <p>Use mathematics to estimate, measure and graph the quantity of a natural resource (e.g., water, paper) used by an individual (or group) in a certain time period</p> <p>Distinguish among reducing, reusing, recycling and replacing as conservation techniques</p>
---

**Grade 4**

<b>Unit Name</b>	<b>Content</b>
<b>Land and Water</b>	<p>Describe the role of the sun's energy (i.e., heating and cooling) in the continuous cycling of water between the earth and the atmosphere through evaporation, condensation and precipitation</p> <p>Use models to demonstrate that topography causes precipitation landing on earth to move in streams and rivers from higher to lower elevations</p> <p>Design and conduct simple investigations to determine how moving water (flowing downhill or in ocean waves) causes changes to the land, the coastline or the course of a stream or river</p> <p>Pose testable questions and employ simple equipment and measuring tools to collect data about factors that affect erosion (e.g., type of earth material in an area, volume of moving water, slope of land, vegetation coverage)</p> <p>Present evidence to support a scientific claim about the relationship between the amount and speed of moving water and the size of earth materials moved (e.g., silt, pebbles, boulders)</p>
<b>Forces and Motion</b>	<p>Demonstrate that a force can cause an object to start moving, stop, or change speed or direction</p> <p>Use measurement tools and standard units to compare and contrast the motion of objects such as toy cars, balls, model rockets or planes in terms of change in position, speed and direction</p> <p>Design and conduct experiments to determine how the motion of objects is related to the mass of the object and the strength of the force applied</p> <p>Describe how friction forces caused by air resistance or interactions between surface materials affect the motion of objects</p> <p>Predict the effect of an object's mass on its motion</p>
<b>Magnetism and Electricity</b>	<p>Construct complete (closed) and incomplete (open) series circuits in which electrical energy is transformed into heat, light, sound and/or motion energy</p> <p>Draw labeled diagrams of complete and incomplete circuits and explain necessary components and how components must be arranged to make a complete circuit</p> <p>Predict whether diagrammed circuit configurations will light a bulb</p> <p>Develop a method for testing conductivity, and analyze data to generalize about which materials are good electrical conductors and which are good insulators</p> <p>Observe magnetic effects associated with electricity and investigate factors that affect the strength of an electromagnet</p> <p>Describe materials that are attracted by magnets</p> <p>Design procedures to move objects and separate mixtures of solids using magnets</p> <p>Investigate how magnets react with other magnets and analyze findings to identify patterns in the interactions between north and south poles of magnets</p> <p>Give examples of uses of magnets (e.g., motors, generators, household devices)</p>

**Ecosystems**

Give examples of ways that living and nonliving things are interdependent within an ecosystem  
Draw diagrams showing how the sun's energy enters and is transferred from producers to consumers in a local land or aquatic food chain  
Design and conduct simple investigations to record interactions among producers, consumers, herbivores, carnivores, omnivores and decomposers in an ecosystem  
Analyze food webs to describe how energy is transferred from plants to various animals in an ecosystem  
Distinguish between naturally occurring changes in ecosystems and those caused by human activity  
Predict the effect an environmental change, such as drought or forest destruction, might have on the community of living things

**Grade 5**

<b>Unit Name</b>	<b>Content</b>
<b>Light</b>	<p>Provide evidence that light travels in straight lines away from a source in all directions</p> <p>Investigate how light is refracted as it passes through a lens or through one transparent material to another.</p> <p>Demonstrate that white light is composed of many colors</p> <p>Explain that all visible objects are reflecting some light to the human eye</p> <p>Contrast the way light is reflected by smooth, shiny objects (e.g., mirror or pool of water) and how it is reflected by other objects</p> <p>Measure angles to predict the path of light reflected by a mirror</p> <p>Determine whether a material is opaque, transparent or translucent based on how light passes through it</p> <p>Design and conduct light absorption experiments that vary the size, length, direction and clarity of a shadow by changing the position of the light-blocking object or the light source</p> <p>Draw diagrams showing the straight path of light rays from a source to a reflecting object to the eye, allowing objects to be seen</p> <p>Describe the properties of different materials and the structures in the human eye that enable humans to perceive color</p> <p>Identify the major structures of the human eye, ear, nose, skin and tongue, and explain their functions</p> <p>Generalize that optical tools, such as binoculars, telescopes, eyeglasses or periscopes, change the path of light by reflecting or refracting it</p> <p>Construct simple periscopes and telescopes, and analyze how the placement of their lenses and mirrors affects the quality of the image formed</p> <p>Evaluate the best optical instrument to perform a given task</p> <p>Design and conduct simple investigations to determine how the shape of a lens or mirror (concave, convex, flat) affects the direction in which light rays travel</p> <p>Explain how eyeglasses or contact lenses improve vision by changing the path of light to the retina</p> <p>Analyze the similarities and differences between structures of the human eye and those of a simple camera</p>
<b>Sound</b>	<p>Generalize that vibrating objects produce sound if the vibrations are transferred from the object through another material (e.g., air, a solid, or a liquid)</p> <p>Demonstrate how the loudness, pitch and quality/timbre of sound can be varied</p> <p>Design and conduct investigations to determine factors that affect pitch</p> <p>Describe the properties of materials that reflect or absorb sound</p> <p>Construct simple musical instruments (e.g., rubber band guitars, drums, etc.) that produce sounds with various pitches, volume and timbres</p> <p>Explain the role of sensory organs in perceiving stimuli (e.g., light/dark, heat/cold, flavors, pain, etc.) and sending signals to the brain</p>

**Earth in the Solar System**

Explain the motion of the Earth relative to the sun that causes Earth to experience cycles of day and night  
Construct models demonstrating Earth's rotation on its axis, the moon's revolution around the Earth, and the Earth and moon revolving around the sun  
Distinguish between the sun as a source of light and the moon as a reflection of that light  
Observe and record the moon's appearance over time and analyze findings to describe the cyclical changes in its appearance from Earth (moon phases)  
Relate the moon phases to changes in the moon's position relative to the Earth and sun during its 29-day revolution around the Earth