

## Table of Contents

Introduction .....	2
Scientific Inquiry.....	3
Physical Setting .....	6
The Living Environment .....	14
Interconnectedness .....	22
Interdisciplinary Problem Solving .....	27

# Introduction

The following Scope and Sequence is primarily for Science content. However, there are numerous interdisciplinary links to other content areas. This curriculum reflects changes in accordance with the New York State *Learning Standards for Mathematics, Science, and Technology*. This document contains specific content for instruction in grades K-4. In addition, the curriculum has also been broken down into grade level packets for teacher use.

This Scope and Sequence document consists of five areas which are congruent with the New York State *Learning Standards for Mathematics, Science, and Technology*. They are **Scientific Inquiry** (from Standard 1: Analysis, Inquiry and Design), **Physical Setting** and **The Living Environment** (Standard 4: Science), **Interconnectedness** (Standard 6: Common Themes), and **Interdisciplinary Problem Solving** (Standard 7). Each NYS Standard is divided into the appropriate Key Ideas and Performance Indicators, with integrated *Essential Questions* as well as sample tasks for each. The sample tasks have been provided to guide teachers' planning and lesson constructing. Teachers are encouraged to alter the sample tasks to meet the needs of their students.

The areas of **Physical Setting** and **The Living Environment** outlines specific declarative knowledge that students should explore in a constructivist approach. A suggested model for teaching science includes five essential phases: engagement, exploration, explanation, elaboration, and evaluation. One characteristic of a constructivist classroom is that time for teaching lessons will vary considerably, some requiring only one day, other lessons requiring several weeks.

The areas of **Scientific Inquiry**, **Interconnectedness**, and **Interdisciplinary Problem Solving** should be taught within the context of the **Physical Setting** and **The Living Environment** areas so that students can discover and construct an understanding of natural phenomena. In a "nutshell," the performance indicators in these areas contain the "how" of science as the sample tasks in Physical Setting and The Living Environment contain the "what."

In addition, sample tasks have been suggested that integrate Standard 5: Technology to include the areas of **Engineering Design; Tools, Resources, and Technological Processes; Computer Technology; Technological Systems; Impacts of Technology; and Management of Technology**. While these sample tasks are specific, they are meant to be a starting point to integrate technology. Other content area documents will also include performance indicators from this NYS Standard.

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 1: Analysis, Inquiry, and Design** Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions. (MST-1)

## SCIENTIFIC INQUIRY

**Key Idea: SI.1.1** The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.

Kindergarten	Grade 1	Grade 2
<ol style="list-style-type: none"> <li>Students ask “why” questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.</li> <li>Students question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.</li> <li>Students develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.</li> </ol>	<ol style="list-style-type: none"> <li>Students ask “why” questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.</li> <li>Students question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.</li> <li>Students develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.</li> </ol>	<ol style="list-style-type: none"> <li>Students ask “why” questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.</li> <li>Students question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.</li> <li>Students develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.</li> </ol>
Grade 3		Grade 4
<ol style="list-style-type: none"> <li>Students ask “why” questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.</li> <li>Students question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.</li> <li>Students develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.</li> </ol>		<ol style="list-style-type: none"> <li>Students ask “why” questions in attempts to seek greater understanding concerning objects and events they have observed and heard about.</li> <li>Students question the explanations they hear from others and read about, seeking clarification and comparing them with their own observations and understandings.</li> <li>Students develop relationships among observations to construct descriptions of objects and events and to form their own tentative explanations of what they have observed.</li> </ol>

***NOTE: The indicators above are repeated purposely. It should be made clear that mathematical analysis should overlap the specific skills and content in all other standards and should be addressed at every grade level.***

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 1: Analysis, Inquiry, and Design** Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions. (MST-1)

## SCIENTIFIC INQUIRY

**Key Idea: SI.1.2** Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed explanations involving the use of conventional techniques and procedures and usually requiring considerable ingenuity.

Kindergarten	Grade 1	Grade 2
<ol style="list-style-type: none"> <li>Students develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.</li> <li>Students share their research plans with others and revise them based on their suggestions.</li> <li>Students carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurements of quantities (e.g., length, mass, volume, temperature and time).</li> </ol>	<ol style="list-style-type: none"> <li>Students develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.</li> <li>Students share their research plans with others and revise them based on their suggestions.</li> <li>Students carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurements of quantities (e.g., length, mass, volume, temperature and time).</li> </ol>	<ol style="list-style-type: none"> <li>Students develop written plans for exploring phenomena or for evaluating explanations guided by questions or proposed explanations they have helped formulate.</li> <li>Students share their research plans with others and revise them based on their suggestions.</li> <li>Students carry out their plans for exploring phenomena through direct observation and through the use of simple instruments that permit measurements of quantities (e.g., length, mass, volume, temperature and time).</li> </ol>
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# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 1: Analysis, Inquiry, and Design** Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions. (MST-1)

## SCIENTIFIC INQUIRY

<b>Key Idea: SI.1.3</b> The observations made while testing proposed explanations, when analyzed using conventional and invented methods, provide new insights into phenomena.		
<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
<ol style="list-style-type: none"> <li>1. Students organize observations and measurements of objects and events through classification and the preparations of simple charts and tables.</li> <li>2. Students interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.</li> <li>3. Students share their findings with others and actively seek their interpretations and ideas.</li> <li>4. Students adjust their explanations and understandings of objects and events based on their findings and new ideas.</li> </ol>	<ol style="list-style-type: none"> <li>1. Students organize observations and measurements of objects and events through classification and the preparations of simple charts and tables.</li> <li>2. Students interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.</li> <li>3. Students share their findings with others and actively seek their interpretations and ideas.</li> <li>4. Students adjust their explanations and understandings of objects and events based on their findings and new ideas.</li> </ol>	<ol style="list-style-type: none"> <li>1. Students organize observations and measurements of objects and events through classification and the preparations of simple charts and tables.</li> <li>2. Students interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.</li> <li>3. Students share their findings with others and actively seek their interpretations and ideas.</li> <li>4. Students adjust their explanations and understandings of objects and events based on their findings and new ideas.</li> </ol>
<b>Grade 3</b>		<b>Grade 4</b>
<ol style="list-style-type: none"> <li>1. Students organize observations and measurements of objects and events through classification and the preparations of simple charts and tables.</li> <li>2. Students interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.</li> <li>3. Students share their findings with others and actively seek their interpretations and ideas.</li> <li>4. Students adjust their explanations and understandings of objects and events based on their findings and new ideas.</li> </ol>		<ol style="list-style-type: none"> <li>1. Students organize observations and measurements of objects and events through classification and the preparations of simple charts and tables.</li> <li>2. Students interpret organized observations and measurements, recognizing simple patterns, sequences, and relationships.</li> <li>3. Students share their findings with others and actively seek their interpretations and ideas.</li> <li>4. Students adjust their explanations and understandings of objects and events based on their findings and new ideas.</li> </ol>

***NOTE: The indicators above are repeated purposely. It should be made clear that mathematical analysis should overlap the specific skills and content in all other standards and should be addressed at every grade level.***

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. (MST-4)

## PHYSICAL SETTING

**Key Idea: P.4.1** The Earth and celestial phenomena can be described by principles of relative motion and perspective.

**Performance Indicator: P.4.1a** Students describe patterns of daily, monthly, and seasonal changes in their environment.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: How are the seasons different?</i></p> <ol style="list-style-type: none"> <li>1. Describes weather patterns which typically occur during the four seasons.</li> <li>2. Identifies clothing and activities as appropriate for certain seasons or weather patterns.</li> <li>3. Uses qualitative terms to describe typical weather patterns during the four seasons (<i>to include snowy, rainy, sunny, windy, warm, cool, hot and cold</i>).</li> </ol>	<p><i>EQ: What patterns in weather occur?</i></p> <ol style="list-style-type: none"> <li>1. Identifies different types precipitation (<i>to include snow, sleet, rain and hail</i>). See also <i>P.4.2a</i>.</li> <li>2. Uses quantitative measures to describe weather patterns.</li> </ol> <p><i>EQ: How is the sun a star?</i></p> <ol style="list-style-type: none"> <li>3. Relates the size of the Earth to that of the sun.</li> <li>4. Describes the sun as a star we see during the day because it is the Earth's closest star.</li> </ol>	<p><i>EQ: How is weather a system?</i></p> <ol style="list-style-type: none"> <li>1. Recognize clouds according to their attributes (<i>to include cirrus, cumulus, stratus and fog</i>).</li> <li>2. Describes how clouds can help determine oncoming weather patterns.</li> <li>3. Identifies methods to monitor severe storm patterns.</li> </ol> <p><i>EQ: How is the Earth part of a larger system?</i></p> <ol style="list-style-type: none"> <li>4. Describes different parts of Earth's day (day and night) and develops an understanding that when it is daytime where we live, it is nighttime on the other side of the world.</li> <li>5. Describes how the rotation of the Earth on its axis every 24 hours produces the day-and-night cycle.</li> <li>6. Describes that the Earth's revolutional journey around the sun is complete after 365 days (<i>one yr</i>).</li> </ol>
Grade 3		Grade 4
<p><i>EQ: What are characteristics of stars?</i></p> <ol style="list-style-type: none"> <li>1. Recognizes that stars are different distances from the Earth, are different sizes, and are so far away they look like distant points of light.</li> <li>2. Develops an understanding that the rotation of the Earth makes it seem as though the stars are moving across the sky.</li> <li>3. Develops an understanding that different stars appear in different seasons because of the Earth's revolution.</li> <li>4. Recognizes star patterns as named constellations (<i>to include Cassiopeia, Orion, and Ursa Major</i>).</li> </ol>		<p><i>EQ: How is the solar system a system?</i></p> <ol style="list-style-type: none"> <li>1. Explains how the sun affects the illumination of the moon.</li> <li>2. Describes how phases of the moon and lunar/ solar eclipses are caused by the rotational/ revolutional relationships among the sun, Earth, and moon.</li> <li>3. Describes characteristics of the moon's surface.</li> <li>4. Recognizes various objects within the solar system (<i>to include planets, comets, moons and meteorites</i>).</li> <li>5. Compares physical features and environmental conditions of the planets within the solar system (<i>to include size, number of moons, length of day/ year, temperature, atmosphere and distance from sun</i>).</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. (MST-4)

## PHYSICAL SETTING

<p><b>Key Idea: P.4.2</b> Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land.</p> <p><b>Performance Indicator: P.4.2a</b> Students describe the relationship among air, water, and land.</p>		
Kindergarten	Grade 1	Grade 2
<p><i>EQ: Why is water important?</i></p> <ol style="list-style-type: none"> <li>1. Recognizes sources, uses and properties of water.</li> <li>2. Investigates whether objects will sink or float in water.</li> </ol>	<p><i>EQ: What patterns in weather occur?</i></p> <ol style="list-style-type: none"> <li>1. Identifies different types precipitation (to include snow, sleet, rain and hail). See also P.4.1a.</li> </ol> <p><i>EQ: How are patterns evident in communities? (see also SS 3.1 and 3.2)</i></p> <ol style="list-style-type: none"> <li>2. Differentiates between land forms and water forms on pictures, maps and globes.</li> <li>3. Identifies Earth’s surface features (to include hills, mountains, valleys, lakes, rivers, streams, oceans and ice caps).</li> </ol>	<p><i>EQ: How is weather a system?</i></p> <ol style="list-style-type: none"> <li>1. Describes a tornado and hurricane, explains their potential danger and explains simple safety precautions.</li> <li>2. Identifies and describes the four steps of the water cycle (to include accumulation, evaporation, condensation, and precipitation).</li> </ol>
Grade 3		Grade 4
<p><i>EQ: What are fossils and how do link to history?</i></p> <ol style="list-style-type: none"> <li>1. Explains what a fossil is and infers that fossils provide clues to the past (prehistoric life).</li> <li>2. Describes what scientists (paleontologists) can infer about dinosaurs based upon fossilized remains.</li> <li>3. Theorizes why dinosaurs are not living today (extinct).</li> </ol>		<p><i>EQ: How do changes in the Earth’s layers affect ecosystems?</i></p> <ol style="list-style-type: none"> <li>1. Describes the three layers of the Earth (crust, mantle, and core).</li> <li>2. Describes the theory of plate movement (tectonics) and how it relates to geologic activity.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. **(MST-4)**

**NYS Standard 3: Mathematics** Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry. **(MST-3)**

## PHYSICAL SETTING

<p><b>Key Idea: P.4.3</b> Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.</p> <p><b>Performance Indicator: P.4.3a</b> Students observe and describe properties of materials using appropriate tools.</p> <p><b>Key Idea: M.3.5</b> Students use measurement in both metric and English measure to provide a major link between the abstractions of mathematics and the real world in order to describe and compare objects and data.</p>		
Kindergarten	Grade 1	Grade 2
<p><i>EQ: How do our senses help us learn about ourselves, others and our environment?</i></p> <ol style="list-style-type: none"> <li>1. Identifies the five basic senses (<i>sight, touch, smell, taste, and sound</i>) and the body part which enables one to use each of the five senses.</li> <li>2. Classifies objects based on sensory information (<i>to include color, texture, size, sound, taste or shape</i>).</li> </ol>	<p><i>EQ: How are objects classified/measured?</i></p> <ol style="list-style-type: none"> <li>1. Classifies objects by comparing their similarities and their differences to other objects.</li> <li>2. Recognizes that standard and/or nonstandard measurements can be used to measure objects and will produce varying results.</li> <li>3. Identifies the importance of a beginning point and an ending point when making comparisons and/or measurements.</li> </ol>	<p><i>EQ: How are rocks used and what are their properties?</i></p> <ol style="list-style-type: none"> <li>1. Describes various properties of rocks (<i>to include color, size, weight, shape, and texture</i>).</li> <li>2. Classifies rocks according to their properties.</li> <li>3. Investigates how balance is affected by the amount of mass, position of mass, and position of fulcrum.</li> <li>4. Demonstrates ability to find the mass of objects placed on a balance using standard and/or nonstandard measurement.</li> <li>5. Applies strategies for comparing and massing objects in order to solve problems.</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How do living things in and around an ecosystem interact with one another and the environment?</i></p> <ol style="list-style-type: none"> <li>1. Describes properties, composition, and different drainage rates of soils (<i>to include sand, silt, clay and loam</i>).</li> <li>2. Describes reasons for soil erosion and ways in which soil can be conserved. (<i>See also L.4.7a</i>)</li> <li>3. Determines which soil types are best for growing certain types of plants.</li> </ol>		<p><i>EQ: How do changes in the Earth's layers affect ecosystems?</i></p> <ol style="list-style-type: none"> <li>1. Identifies that rock is composed of minerals.</li> <li>2. Describes the process of the formation of igneous, sedimentary, and metamorphic rocks.</li> <li>3. Classifies rocks based on attributes (<i>to include color, hardness, and luster</i>).</li> <li>4. Identifies uses of rocks and minerals.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. **(MST-4)**

## PHYSICAL SETTING

<p><b>Key Idea: P.4.3</b> Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.</p> <p><b>Performance Indicator: P.4.3b</b> Students describe chemical and physical changes, including changes in states of matter.</p>		
Kindergarten	Grade 1	Grade 2
<p><i>EQ: How does an object change?</i></p> <ol style="list-style-type: none"> <li>Investigates that no matter how parts of an object are assembled, the mass of the object is the same even when the object is disassembled.</li> <li>Describes ways in which food can be changed (<i>to include changes in states of matter</i>). (See also P.4.4a)</li> </ol>	<p><i>EQ: What are the physical properties of an object?</i></p> <ol style="list-style-type: none"> <li>Describes a mixture as two or more objects which are combined but which still retain their own properties.</li> <li>Describes how some solutions are formed when a solid is mixed with a liquid and only seems to disappear because the solid has dissolved.</li> </ol>	<p><i>EQ: How are rocks used and what are their properties?</i></p> <ol style="list-style-type: none"> <li>Recognizes that the mass of an object is not determined by the size of an object.</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How is matter described?</i></p> <ol style="list-style-type: none"> <li>Describes matter as anything that has volume and mass.</li> <li>Uses properties to describe states of matter.</li> <li>Identifies that heat energy can affect an object's state of matter.</li> </ol>		<p><i>EQ: How do changes in the Earth's layers affect ecosystems?</i></p> <ol style="list-style-type: none"> <li>Identifies the causes of volcanic and earthquake activity.</li> <li>Describes how earthquakes are measured.</li> <li>Describes the effects of a volcano and an earthquake and explains their potential danger.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. **(MST-4)**

**NYS Standard 5: Technology** Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. **(MST-5)**

## PHYSICAL SETTING

**Key Idea: P.4.4** Energy exists in many forms, and when these forms change energy is conserved.

**Performance Indicator: P.4.4a** Students describe a variety of forms of energy and the changes that occur in objects when they interact with those forms of energy.

**Key Idea: T.5.2** Technological tools, materials, and other resources should be selected on the basis of safety, cost, availability, appropriateness, and environmental impact; technological processes change energy, information, and material resources into more useful forms.

**Performance Indicator:** Students use simple manufacturing processes to produce a product.

**Key Idea: T.5.3** Computers, as tools for design, modeling, information processing, communication, and system control, have greatly increased human productivity and knowledge.

**Performance Indicator:** Students control computerized devices and systems through programming.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: What do living things need to survive?</i></p> <ol style="list-style-type: none"> <li>Recognize that food gives animals energy to grow and move.</li> <li>Identifies plants and animals as food sources.</li> </ol> <p><i>EQ: How does an object change?</i></p> <ol style="list-style-type: none"> <li>Describes ways in which food can be changed (<i>to include heating, freezing, melting, baking, mixing, bending, and cutting</i>). (See also P.4.3b)</li> <li>Use a microwave to melt a substance (with teacher's assistance).</li> </ol>	<p><i>EQ: How are objects classified/measured?</i></p> <ol style="list-style-type: none"> <li>Identifies distinguishing characteristics between water and ice.</li> <li>Identifies temperature as a measurement of the hotness of an object.</li> <li>Measures degree of hotness by using a thermometer (<i>Fahrenheit and/or Celsius</i>).</li> <li>Compares the effect of water left in an open container to water left in a closed container.</li> </ol>	<p><i>EQ: What is light?</i></p> <ol style="list-style-type: none"> <li>Identifies sources of light.</li> <li>Identifies that light is necessary in order to observe color.</li> <li>Uses prisms to observe and identify colors in a spectrum.</li> <li>Differentiates among transparent, translucent, or opaque objects.</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How do living things in and around an ecosystem interact with one another and the environment?</i></p> <ol style="list-style-type: none"> <li>Identifies that heat energy can affect an object's state of matter.</li> <li>Identifies that energy in the form of food is needed for growth of organisms. (See also L.4.6b)</li> <li>Traces the processing of food from its source to the table.</li> <li>Utilizes simple tests to identify nutrients found in food (<i>to include fat and carbohydrates</i>). (See also L.4.5c)</li> <li>Use manufacturing process (<i>assembly, production, quality control</i>) to experience the processing of food (eg., grow, harvest, and assemble vegetables, etc).</li> </ol>		<p><i>EQ: How do living things depend on other organisms?</i></p> <ol style="list-style-type: none"> <li>Describes the passage of energy from producers to consumers. (See L.4.6b)</li> <li>Describes the process by which plants (<i>producers</i>) make food (<i>photosynthesis</i>).</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. **(MST-4)**

**NYS Standard 5: Technology** Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. **(MST-5)**

## PHYSICAL SETTING

<p><b>Key Idea: P.4.4</b> Energy exists in many forms, and when these forms change energy is conserved.</p> <p><b>Performance Indicator: P.4.4b</b> Students observe the way one form of energy can be transformed into another form of energy present in common situations.</p> <p><b>Key Idea: T.5.2</b> Technological tools, materials, and other resources should be selected on the basis of safety, cost, availability, appropriateness, and environmental impact; technological processes change energy, information, and material resources into more useful forms.</p> <p><b>Performance Indicator:</b> Students explore, use, and process a variety of materials and energy sources to design and construct things.</p> <p><b>Key Idea: T.5.4</b> Technological systems are designed to achieve specific results and produce outputs, such as products, structures, services, energy, or other systems.</p> <p><b>Performance Indicator:</b> Students identify familiar examples of technological systems that are used to satisfy human needs and wants, and select them on the basis of safety, cost, and function.</p>		
Kindergarten	Grade 1	Grade 2
<p><i>EQ: What is energy?</i></p> <ol style="list-style-type: none"> <li>Identifies everyday items that use energy.</li> </ol>	<p><i>EQ: How is sound produced?</i></p> <ol style="list-style-type: none"> <li>Describes properties of sound (<i>to include volume, pitch, and quality</i>).</li> <li>Identifies that sound occurs as a result of vibration.</li> <li>Explores different methods of generating sound.</li> </ol>	<p><i>EQ: How are forms of energy created?</i></p> <ol style="list-style-type: none"> <li>Describes how people use electricity and practice safety when using electricity.</li> <li>Identifies that static electricity is produced when two different materials rub together (<i>friction</i>) and generate opposite charges (<i>positive and negative</i>).</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How is energy measured and described?</i></p> <ol style="list-style-type: none"> <li>Describes various energy forms (<i>to include heat and light</i>) and energy sources (<i>to include the sun, wind, water and fossil fuels</i>).</li> <li>Measures degree of hotness by using a thermometer (<i>Celsius and Fahrenheit</i>).</li> <li>Identifies conductors and insulators of heat energy.</li> </ol>		<p><i>EQ: How does an object acquire an electrical charge?</i></p> <ol style="list-style-type: none"> <li>Describes how an object acquires an electrical charge.</li> <li>Describes that electricity can flow along a path called a circuit.</li> <li>Explores ways to complete a circuit.</li> <li>Identifies conductors and insulators of electricity.</li> <li>Explores energy sources by making a simple motor that uses electrical energy to produce continuous mechanical motion.</li> <li>Assembles and operates a system connected in a series circuit (<i>eg., battery, switch, doorbell, etc</i>).</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. **(MST-4)**

**NYS Standard 5: Technology** Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. **(MST-5)**

## PHYSICAL SETTING

<p><b>Key Idea: P.4.5</b> Energy and matter interact through forces that result in changes in motion.</p> <p><b>Performance Indicator: P.4.5a</b> Students describe the effects of common forces (pushes and pulls) on objects, such as those caused by gravity, magnetism, and mechanical forces.</p> <p><b>Key Idea: T.5.2</b> Technological tools, materials, and other resources should be selected on the basis of safety, cost, availability, appropriateness, and environmental impact; technological processes change energy, information, and material resources into more useful forms.</p> <p><b>Performance Indicator:</b> Students explore, use, and process a variety of materials and energy sources to design and construct things.</p>					
Kindergarten		Grade 1		Grade 2	
<p><i>EQ: What do living things need to survive?</i></p> <p><i>EQ: How do things move?</i></p> <p>1. Describes and classifies ways in which living and non-living objects move (to include circular, zigzag, back and forth, fast or slow, starting and stopping).</p> <p><i>EQ: How do things move?</i></p> <p>2. Describes how the push or the pull on an object will change its motion.</p>		<p><i>EQ: How do magnets work?</i></p> <p>1. Describes how magnets can pull (attract) objects.</p> <p>2. Describes how a magnet can push against (repel) other magnets.</p>		<p><i>EQ: What is a force?</i></p> <p>1. Identifies force as a push or a pull.</p> <p>2. Recognizes work is done when a force moves an object.</p>	
Grade 3			Grade 4		
<p><i>EQ: How is energy measured and described?</i></p> <p>1. Identifies that there are different types of forces (to include gravity and friction).</p>			<p><i>EQ: How does magnetism relate to energy?</i></p> <p>1. Describes magnetism (to include magnetic field, magnetic pole, attraction and repulsion).</p>		

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. (MST-4)

**NYS Standard 5: Technology** Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. (MST-5)

## PHYSICAL SETTING

**Key Idea: P.4.5** Energy and matter interact through forces that result in changes in motion.

**Performance Indicator: P.4.5b** Students describe how forces can operate across distances.

**Key Idea: T.5.1** Engineering design is an iterative process involving *modeling* and *optimization* used to develop technological solutions to problems within given constraints.

**Performance Indicators:** Students:

- describe objects, imaginary or real, that might be modeled or made differently and suggest ways in which the objects can be changed, fixed, or improved
- investigate prior solutions and ideas from books, magazines, family, friends, neighbors, and community members
- generate ideas for possible solutions, individually and through group activity; apply age-appropriate mathematics and science skills; evaluate the ideas and determine the best solution; and explain reasons for their choices.
- plan and build, under supervision, a model of the solution using familiar materials, processes, and hand tools. discuss how best to test the solution; perform the test under teacher supervision; record and portray results through numerical and graphic means; discuss orally why things worked or didn't work; and summarize results in writing, suggesting ways to make the solution better.

**Key Idea: T.5.2** Technological tools, materials, and other resources should be selected on the basis of safety, cost, availability, appropriateness, and environmental impact; technological processes change energy, information, and material resources into more useful forms.

**Performance Indicator:** Students develop basic skill in the use of hand tools.

**Key Idea: T.5.4** Technological systems are designed to achieve specific results and produce outputs, such as products, structures, services, energy, or other systems.

**Performance Indicator:** Students understand that larger systems are made up of smaller component subsystems.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: Why is air important?</i></p> <ol style="list-style-type: none"> <li>1. Recognizes that air is a substance which surrounds us and takes up space.</li> <li>2. Describes how air and wind affect the motion of objects.</li> </ol> <p><i>EQ: How do things move?</i></p> <ol style="list-style-type: none"> <li>3. Describes animal movement and machine movement through air (<i>flight</i>).</li> <li>4. Designs a different or improved machine for flight.</li> </ol>	<p><i>EQ: How do magnets work?</i></p> <ol style="list-style-type: none"> <li>1. Recognizes that magnets can move other objects without touching them.</li> </ol>	<p><i>EQ: What is a force?</i></p> <ol style="list-style-type: none"> <li>1. Identifies simple machines and how they make work easier (<i>to include levers, gears, pulleys and inclined planes/ ramps</i>).</li> <li>2. Recognizes a compound machine as a combination of simple machines.</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How is energy measured and described?</i></p> <ol style="list-style-type: none"> <li>1. Compares the amount of force needed to move an object over different surfaces by using a spring scale.</li> <li>2. Describes motion in terms of distance, time and speed.</li> </ol>		<p><i>EQ: How does magnetism relate to energy?</i></p> <ol style="list-style-type: none"> <li>1. Measures the strength of magnets working alone or in combination.</li> </ol> <p>Investigates the use of magnets as solutions to problems (<i>eg., pacemakers, computers, etc</i>).</p>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. (MST-4)

## THE LIVING ENVIRONMENT

**Key Idea: L.4.1** Living things are both similar to and different from each other and nonliving things.

**Performance Indicator: L.4.1a** Students describe the characteristics of and variations between living and nonliving things.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: What do living things need to survive?</i></p> <ol style="list-style-type: none"> <li>Classifies objects as either living, nonliving or once living.</li> <li>Classifies living things and nonliving things based on their similarities and differences.</li> </ol>	<p><i>EQ: How do amphibians grow?</i></p> <ol style="list-style-type: none"> <li>Observe the life cycle characteristics of an amphibian (eg., frog, newt, salamander, etc).</li> <li>Understands and compares the basic needs of amphibians and other living things.</li> </ol>	<p><i>EQ: How do insects grow and change?</i></p> <ol style="list-style-type: none"> <li>Recognizes the life cycle characteristics of an insect (eg., butterfly, dragonfly, moth, bee, ant, grasshopper, cricket, etc).</li> <li>Understands and compares the basic needs of insects to other living things.</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How do mammals grow and change?</i></p> <ol style="list-style-type: none"> <li>Observes and recognizes the life cycle characteristics of a mammal (eg., gerbil, cat, rabbit, bat, etc).</li> <li>Understands and compares the basic needs of mammals to other living things.</li> </ol>		

**Key Idea: L.4.1** Living things are both similar to and different from each other and nonliving things.

**Performance Indicator: L.4.1b** Students describe the life processes common to all living things.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: What do living things need to survive?</i></p> <ol style="list-style-type: none"> <li>Recognizes that living things have basic needs (to include air, water, food and shelter).</li> </ol>	<p><i>EQ: How do plants grow?</i></p> <ol style="list-style-type: none"> <li>Identifies that plants grow in a predictable sequence.</li> <li>Identifies changes which occur to basic parts of plants during their life cycle.</li> <li>Identifies what plants need in order to sustain their life cycle.</li> <li>Compares life cycles of plants to amphibians.</li> </ol>	<p><i>EQ: How are living things systems?</i></p> <ol style="list-style-type: none"> <li>Identifies that living things have special body parts that enable them to do certain things.</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How do living things in and around an ecosystem interact with one another and the environment?</i></p> <ol style="list-style-type: none"> <li>Identifies common features to all living things (to include being made of cells, growing and changing, needing energy, reproducing and responding to the environment).</li> </ol>		<p><i>EQ: How do living things depend on other organisms?</i></p> <ol style="list-style-type: none"> <li>Compares life processes of living specimens within food webs and food chains.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. (MST-4)

## THE LIVING ENVIRONMENT

<p><b>Key Idea: L.4.2</b> Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.</p> <p><b>Performance Indicator: L.4.2a</b> Students recognize that traits of living things are both inherited and acquired or learned.</p>		
<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
<p><i>EQ: How do our senses help us learn about ourselves, others and our environment?</i></p> <ol style="list-style-type: none"> <li>1. Describes the appearance of physical traits in people.</li> </ol>	<p><i>EQ: How do families interact and change? (see also SS 1.1-1.3, 2.1)</i></p> <ol style="list-style-type: none"> <li>1. Describes kinds of and characteristics of families.</li> <li>2. States what it means to be unique.</li> </ol>	<p><i>EQ: How are living things systems?</i></p> <ol style="list-style-type: none"> <li>1. Defines body systems.</li> <li>2. Describes how body systems work together.</li> </ol>
<b>Grade 3</b>		<b>Grade 4</b>
<p><i>EQ: What are common features shared by all living things?</i></p> <ol style="list-style-type: none"> <li>1. Recognizes that some living things are made of one cell and some are made up of many cells.</li> </ol>		
<p><b>Key Idea: L.4.2</b> Organisms inherit genetic information in a variety of ways that result in continuity of structure and function between parents and offspring.</p> <p><b>Performance Indicator: L.4.2b</b> Students recognize that for humans and other living things there is genetic continuity between generations.</p>		
<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
<p><i>EQ: What do living things need to survive?</i></p> <ol style="list-style-type: none"> <li>2. Recognizes that seeds come from and grow into plants. (See also L.4.6b).</li> </ol>	<p><i>EQ: How do plants grow?</i></p> <ol style="list-style-type: none"> <li>1. Identifies that plants grow in a predictable sequence. (See also L.4.1b).</li> </ol> <p><i>EQ: How do amphibians grow?</i></p> <ol style="list-style-type: none"> <li>2. Understands that as amphibians proceed through life cycle, changes occur. (See also L.4.4b).</li> </ol>	<p><i>EQ: How do insects grow and change?</i></p> <ol style="list-style-type: none"> <li>1. Understands that as insects proceed through life cycle, changes occur. (See also L.4.4b).</li> <li>2. Identifies and investigates variables which may affect plant growth and germination (to include water, light, space, temperature and soil.)</li> </ol>
<b>Grade 3</b>		<b>Grade 4</b>
<p><i>EQ: How do mammals grow and change?</i></p> <ol style="list-style-type: none"> <li>1. Understands that as mammals grow, changes occur. (See also L.4.4b).</li> </ol> <p><i>EQ: How do living things in and around an ecosystem interact with one another and the environment?</i></p> <ol style="list-style-type: none"> <li>1. Recognizes that plants use a variety of parts to produce new plants (to include seeds, tubers, bulbs and spores).</li> <li>2. Describes the predictable nature of seed dispersal.</li> </ol>		<p><i>EQ: What is the relationship between food, energy, and our bodies?</i></p> <ol style="list-style-type: none"> <li>1. Describes cells, tissues, and organs.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. (MST-4)

## THE LIVING ENVIRONMENT

**Key Idea: L.4.3** Individual organisms and species change over time.

**Performance Indicator: L.4.3a** Students describe how the structures of plants and animals complement the environment of the plant or animal.

Kindergarten	Grade 1	Grade 2
	<p><i>EQ: How do plants and animals interact in the environment?</i></p> <ol style="list-style-type: none"> <li>Describes behavioral and physical adaptations of amphibians. (See also L.4.1a.)</li> <li>Describes physical adaptations of plants.</li> </ol>	<p><i>EQ: What are the physical characteristics of plants and animals?</i></p> <ol style="list-style-type: none"> <li>Describes body coverings which protect animals from surrounding conditions.</li> <li>Describes behavioral and physical adaptation of insects.</li> <li>Describes physical adaptations of plants.</li> </ol>

### Grade 3

*EQ: How do living things in and around an ecosystem interact with one another and the environment?*

*EQ: How do mammals grow and change?*

- Describes behavioral and physical adaptations of mammals.

### Grade 4

*EQ: How do living things depend on other organisms?*

- Describes the cyclical nature of animals' instinctive behavior (to include migration and hibernation).
- Develops an understanding that both plant and animal communities change over time (to include succession in a land community and in a water community).

**Key Idea: L.4.3** Individual organisms and species change over time.

**Performance Indicator: L.4.3b** Students observe that differences within a species may give individuals an advantage in surviving and reproducing.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: What do living things need to survive?</i></p> <ol style="list-style-type: none"> <li>Describes basic habitats of animals living in the wild. (See also L.4.5b.)</li> </ol>	<p><i>EQ: How do amphibians grow?</i></p> <ol style="list-style-type: none"> <li>Describes differences among amphibians (eg., frog, newt, salamander, etc).</li> <li>Explains advantages of species for survival in habitat.</li> </ol>	<p><i>EQ: How do insects grow and change?</i></p> <ol style="list-style-type: none"> <li>Describes differences among insects (eg., butterfly, dragonfly, moth, bee, ant, grasshopper, cricket, etc).</li> <li>Describes different ways and reasons why animals communicate (to include sound, color, movement and scent). (See also L.4.5b.)</li> </ol>

### Grade 3

*EQ: How do living things in and around an ecosystem interact with one another and the environment?*

- Describes differences among mammals (eg., gerbil, cat, rabbit, bat, etc).
- Classifies animals according to how and what they eat (herbivore, carnivore or omnivore).
- Describes differences among species of dinosaurs.

### Grade 4

*EQ: How do living things depend on other organisms?*

- Identifies living specimens within food webs and/or chains that have survival advantages. (See also L.4.5b.)

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. (MST-4)

**NYS Standard 5: Technology** Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. (MST-5)

## THE LIVING ENVIRONMENT

**Key Idea: L.4.4** The continuity of life is sustained through reproduction and development.  
**Performance Indicator: L.4.4a** Students describe the major stages in the life cycles of selected plants and animals.  
**Key Idea: T.5.3** Computers, as tools for design, modeling, information processing, communication, and system control, have greatly increased human productivity and knowledge.  
**Performance Indicator:** Students use the computer as a tool for generating and drawing ideas.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: How do animals change and grow?</i></p> <ol style="list-style-type: none"> <li>Describes different ways animals come into the world and change as they grow. (See also L.4.4b).</li> <li>Investigates the life cycle of various animals hatching from eggs.</li> <li>Uses Kid Pix or Power Point to illustrate an animal.</li> </ol>	<p><i>EQ: How do amphibians grow?</i></p> <ol style="list-style-type: none"> <li>Observes the life cycle characteristics of an amphibian (eg., frog, newt, salamander, etc).</li> <li>Uses Kid Pix or Power Point to illustrate the life cycle of an amphibian.</li> </ol>	<p><i>EQ: How do insects grow and change?</i></p> <ol style="list-style-type: none"> <li>Observes and recognizes the life cycle characteristics of insects (eg., butterfly, dragonfly, moth, bee, ant, grasshopper, cricket, etc). (See also L.4.1a.)</li> <li>Uses Kid Pix or Power Point to illustrate the life cycle of an insect.</li> </ol>

Grade 3	Grade 4
<p><i>EQ: How do mammals grow and change?</i></p> <ol style="list-style-type: none"> <li>Observes and recognizes the life cycle characteristics of a mammal (eg., gerbil, cat, rabbit, bat, etc).</li> <li>Investigates and explores the predictable behavioral patterns of a mammal.</li> <li>Uses Kid Pix or Power Point to illustrate the life cycle of a mammal.</li> </ol>	<p><i>EQ: How do living things depend on other organisms?</i></p> <ol style="list-style-type: none"> <li>Compares life cycle stages of living specimens within food webs and food chains.</li> <li>Uses Hyperstudio, Power Point, or similar software to present a food chain.</li> </ol>

**Key Idea: L.4.4** The continuity of life is sustained through reproduction and development.  
**Performance Indicator: L.4.4b** Students describe evidence of growth, repair, and maintenance, such as nails, hair, and bone, and the healing of cuts and bruises.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: How do animals change and grow?</i></p> <ol style="list-style-type: none"> <li>Describes different ways animals come into the world and change as they grow. (See also L.4.4a).</li> </ol>	<p><i>EQ: How do amphibians grow?</i></p> <ol style="list-style-type: none"> <li>Understands that as amphibians grow, changes occur. (See also L.4.2b.)</li> </ol>	<p><i>EQ: How do insects grow and change?</i></p> <ol style="list-style-type: none"> <li>Understands that as insects grow, changes occur. (See also L.4.2b.)</li> </ol>

Grade 3	Grade 4
<p><i>EQ: How do mammals grow and change?</i></p> <ol style="list-style-type: none"> <li>Understands that as mammals grow, changes occur. (See also L.4.2b.)</li> <li>Recognize that magnification makes an object appear larger.</li> </ol>	<p><i>EQ: What is the relationship between food, energy, and our bodies?</i></p> <ol style="list-style-type: none"> <li>Describes the natural defenses of the human body.</li> <li>Explains how vaccines help prevent disease.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. (MST-4)

## THE LIVING ENVIRONMENT

**Key Idea: L.4.5** Organisms maintain a dynamic equilibrium that sustains life.

**Performance Indicator: L.4.5a** Students describe basic life functions of common living specimens (guppy, mealworm, gerbil).

Kindergarten	Grade 1	Grade 2
<p><i>EQ: What do living things need to survive?</i></p> <ol style="list-style-type: none"> <li>Classifies animals as either wild or domestic.</li> <li>Describes how domestic animals are cared for.</li> </ol>	<p><i>EQ: How do plants and animals interact in the environment?</i></p> <ol style="list-style-type: none"> <li>Observe the characteristics of an amphibian (eg., frog, newt, salamander, etc).</li> </ol>	<p><i>EQ: How do insects grow and change?</i></p> <ol style="list-style-type: none"> <li>Observes and describes the characteristics of an insect (eg., butterfly, dragonfly, moth, bee, ant, grasshopper, cricket, etc).</li> </ol>

Grade 3	Grade 4
<p><i>EQ: How do mammals grow and change?</i></p> <ol style="list-style-type: none"> <li>Observes and recognizes the characteristics of a mammal (eg., gerbil, cat, rabbit, bat, etc).</li> </ol>	<p><i>EQ: How do living things depend on other organisms?</i></p> <ol style="list-style-type: none"> <li>Compares life functions of living specimens within food webs and food chains.</li> </ol>

**Key Idea: L.4.5** Organisms maintain a dynamic equilibrium that sustains life.

**Performance Indicator: L.4.5b** Students describe survival behaviors of common living specimens.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: What do living things need to survive?</i></p> <ol style="list-style-type: none"> <li>Describes basic habitats of animals living in the wild.</li> <li>Describes various ways adult animals care for their young.</li> </ol>	<p><i>EQ: How do plants and animals interact in the environment?</i></p> <ol style="list-style-type: none"> <li>Explains how some plants and animals are endangered because of ways people negatively affect the environment.</li> <li>Identifies living things in nature that are endangered.</li> <li>Observes and identifies survival behaviors of amphibians.</li> </ol>	<p><i>EQ: What are physical characteristics of plants and animals?</i></p> <ol style="list-style-type: none"> <li>Describes different ways and reasons why animals communicate (to include sound, color, movement and scent). (See also L.4.3b)</li> <li>Observes and describes predictable behavioral patterns of insects.</li> </ol>

Grade 3	Grade 4
<p><i>EQ: How do living things in and around an ecosystem interact with one another and the environment?</i></p> <ol style="list-style-type: none"> <li>Describes dinosaurs as herbivore, carnivore or omnivore.</li> <li>Relates behavior patterns of dinosaurs to survival and extinction.</li> </ol>	<p><i>EQ: How do living things depend on other organisms?</i></p> <ol style="list-style-type: none"> <li>Identifies living specimens within food webs and/ or chains that have survival advantages. (See also L.4.3.b)</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. **(MST-4)**

**NYS Standard 1: Personal Health and Fitness** Students will have the necessary knowledge and skills to establish and maintain physical fitness, participate in physical activity, and maintain personal health. **(H-1)**

## THE LIVING ENVIRONMENT

**Key Idea: L.4.5** Organisms maintain a dynamic equilibrium that sustains life.

**Performance Indicator: L.4.5c** Students describe the factors that help promote good health and growth in humans.

**Key Idea: Health Education H.1.1** Students will understand human growth and development and recognize the relationship between behaviors and healthy development. They will understand ways to promote health and prevent disease and will demonstrate and practice positive health behaviors.

**Performance Indicators:**

- Students know how basic body systems work and interrelate in normal patterns of growth and development.
- Students possess basic knowledge and skills which support positive health choices and behaviors.
- Students understand how behaviors such as food selection, exercise, and rest affect growth and development.
- Students know about some diseases and disorders and how they are prevented and treated.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: How do you stay healthy?</i></p> <ol style="list-style-type: none"> <li>1. Identifies food derived from plants and animals.</li> <li>2. Identifies healthy and unhealthy snacks and foods.</li> <li>3. Explains the importance of exercise and play.</li> <li>4. Explains that germs spread from one person to another.</li> <li>5. Demonstrates behaviors to protect self and others from germs.</li> </ol>	<p><i>EQ: How do you choose to be healthy?</i></p> <ol style="list-style-type: none"> <li>1. Describes function and caring of teeth.</li> <li>2. Identifies food groups as in Food Guide Pyramid.</li> </ol>	<p><i>EQ: How are living things systems?</i></p> <ol style="list-style-type: none"> <li>1. Explains purpose and function of ears.</li> <li>2. Explains the function of eyes.</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How is energy measured and described?</i></p> <ol style="list-style-type: none"> <li>1. Utilizes simple tests to identify nutrients found in food (to include fat and carbohydrates). (See also P.4.4a.)</li> <li>2. Determines the origin of a food source (as either a plant and/ or animal).</li> <li>3. Describes the function of lungs.</li> </ol>		<p><i>EQ: What is the relationship between food, energy, and our bodies?</i></p> <ol style="list-style-type: none"> <li>1. Explains the importance of muscular endurance, strength, flexibility, and fitness skills.</li> <li>2. Describes diseases that are communicable and noncommunicable.</li> <li>3. Explains the function of the heart and risk factors of heart disease.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. (MST-4)

## THE LIVING ENVIRONMENT

**Key Idea: L.4.6** Plants and animals depend on each other and their physical environment.

**Performance Indicator: L.4.6a** Students describe how plants and animals, including humans, depend upon each other and the nonliving environment.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: What do living things need to survive?</i></p> <ol style="list-style-type: none"> <li>Identifies how people routinely rely on plants (to include food, clothing and shelter).</li> </ol>	<p><i>EQ: How do plants and animals interact in the environment?</i></p> <ol style="list-style-type: none"> <li>Explains the impact of little to no precipitation and the effects of too much precipitation to life on Earth.</li> </ol>	<p><i>EQ: What are physical characteristics of plants and animals?</i></p> <ol style="list-style-type: none"> <li>Observes and describes communities of animals (eg., ant colonies, etc).</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How do living things in and around an ecosystem interact with one another and the environment?</i></p> <ol style="list-style-type: none"> <li>Describes the interdependence of living things within an ecosystem (to include predators, available food and shelter, etc).</li> </ol>		<p><i>EQ: How do living things depend on other organisms?</i></p> <ol style="list-style-type: none"> <li>Explains how components of an ecosystem are interrelated.</li> <li>Describes how plants and animals depend upon each other (consumers/ producers) within food webs and/ or chains.</li> </ol>

**Key Idea: L.4.6** Plants and animals depend on each other and their physical environment.

**Performance Indicator: L.4.6b** Students describe the relationship of the sun as an energy source for living and nonliving cycles.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: How are the day sky and night sky different?</i></p> <ol style="list-style-type: none"> <li>Distinguishes among and describes objects in the day sky and objects in the night sky (to include the Earth, moon, sun, and stars).</li> <li>Compares and contrasts objects or events which occur during the day to those which occur during the night.</li> </ol> <p><i>EQ: What do living things need to survive?</i></p> <ol style="list-style-type: none"> <li>Recognizes that seeds grow into plants and need sunlight. (See also L.4.2.b)</li> </ol>	<p><i>EQ: How is the sun a star?</i></p> <ol style="list-style-type: none"> <li>Identifies how the sun affects the Earth (to include light, heat, shadows, time and direction).</li> <li>Explains how sunlight can be harmful and helpful.</li> </ol>	<p><i>EQ: What are physical characteristics of plants and animals?</i></p> <ol style="list-style-type: none"> <li>Identifies and investigates how sunlight affects plant growth.</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How is energy measured and described?</i></p> <ol style="list-style-type: none"> <li>Identifies that the sun provides the energy for the growth of organisms in the form of food. (See also P.4.4a.)</li> <li>Understands the relationship of the sun in various ecosystems.</li> </ol>		<p><i>EQ: How do living things depend on other organisms?</i></p> <ol style="list-style-type: none"> <li>Describes the passage of energy from producers to consumers. (See also P.4.4a.)</li> <li>Differentiates between a food web and a food chain.</li> <li>Describes the role of decomposers in an ecosystem.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 4: Science** Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science. (MST-4)

**NYS Standard 5: Technology** Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs. (MST-5)

## THE LIVING ENVIRONMENT

**Key Idea: L.4.7** Human decisions and activities have had a profound impact on the physical and living environment.

**Performance Indicator: L.4.7a** Students identify ways in which humans have changed their environment and the effects of those changes.

**Key Idea: T.5.3** Computers, as tools for design, modeling, information processing, communication, and system control, have greatly increased human productivity and knowledge.

**Performance Indicator:** Students model and simulate the design of a complex environment by giving direct commands.

**Key Idea: T.5.6** Technology can have positive and negative impacts on individuals, society, and the environment and humans have the capability and responsibility to constrain or promote technological development.

**Performance Indicator:** Students describe how technology can have positive and negative effects on the environment and on the way people live and work.

**Key Idea: T.5.7** Project management is essential to ensuring that technological endeavors are profitable and that products and systems are of high quality and built safely, on schedule, and within budget.

**Performance Indicator:** Students speculate on and model possible technological solutions that can improve safety and quality of the school or community environment.

Kindergarten	Grade 1	Grade 2
<p><i>EQ: Why is water/ air important?</i> <i>EQ: How do people rely on nature?</i></p> <ol style="list-style-type: none"> <li>1. Describes what is made by nature.</li> <li>2. Explains importance of keeping the Earth clean.</li> <li>3. Identifies items that can be recycled.</li> <li>4. Describes how noise can affect the sense of hearing.</li> </ol>	<p><i>EQ: How do plants and animals interact in the environment?</i></p> <ol style="list-style-type: none"> <li>1. Explains how some plants and animals are endangered because of ways people negatively affect the environment. (See also L.4.5b.)</li> <li>2. Generates ideas on ways in which endangered organisms can be protected.</li> </ol>	<p><i>EQ: How do humans impact the environment?</i></p> <ol style="list-style-type: none"> <li>1. Describes the impact humans have on Earth's resources (to include construction, pollution and land fills).</li> <li>2. Recognizes recycling as a way to decrease garbage and identifies the recycling symbol as well as the three R's (Reduce, Reuse and Recycle).</li> <li>3. Identifies and sorts items which can be recycled.</li> </ol>
Grade 3		Grade 4
<p><i>EQ: How do living things in and around an ecosystem interact with one another and the environment?</i></p> <ol style="list-style-type: none"> <li>1. Describes reasons for soil erosion and ways in which soil can be conserved. (See also P.4.3a.)</li> <li>2. Identifies the importance of conserving water and suggests ways to save water.</li> </ol>		<p><i>EQ: How do living things depend on other organisms?</i></p> <ol style="list-style-type: none"> <li>1. Describes ways in which humans have altered local ecosystems.</li> <li>2. Describes conservation methods that students can employ.</li> <li>3. Uses SimCity, Theme Park, The Factory, or similar software to model and simulate an environment where they can explore human impact on ecosystems.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 6: Interconnectedness: Common Themes** Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning. (MST-6)

## INTERCONNECTEDNESS: COMMON THEMES

**Key Idea: I.6.1 Systems Thinking** Through systems thinking, people can recognize the commonalities that exist among all systems and how parts of a system interrelate and combine to perform specific functions.

<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
<p><i>EQ: What do living things need to survive?</i></p> <ol style="list-style-type: none"> <li>Students observe and describe interactions among components of simple systems.</li> <li>Students identify common things that can be considered to be systems (e.g., living things).</li> </ol>	<p><i>EQ: How do amphibians/ plants grow?</i></p> <ol style="list-style-type: none"> <li>Students observe and describe interactions among components of simple systems.</li> <li>Students identify common things that can be considered to be systems (e.g., amphibian growth, food webs).</li> </ol>	<p><i>EQ: How are living things systems?</i></p> <ol style="list-style-type: none"> <li>Students observe and describe interactions among components of simple systems.</li> <li>Students identify common things that can be considered to be systems (e.g., ant communities, plant growth, human beings).</li> </ol>
<b>Grade 3</b>		<b>Grade 4</b>
<p><i>EQ: How do living things in and around an ecosystem interact with one another and the environment?</i></p> <ol style="list-style-type: none"> <li>Students observe and describe interactions among components of simple systems.</li> <li>Students identify common things that can be considered to be systems (e.g., ecosystem).</li> </ol>		<p><i>EQ: How do living things depend on other organisms?</i></p> <ol style="list-style-type: none"> <li>Students observe and describe interactions among components of simple systems.</li> <li>Students identify common things that can be considered to be systems (e.g., food webs, food chains, ecosystems).</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 6: Interconnectedness: Common Themes** Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning. (MST-6)

## INTERCONNECTEDNESS: COMMON THEMES

**Key Idea: I.6.2 Models** Models are simplified representations of objects, structures, or systems used in analysis, explanation, interpretation, or design.

Kindergarten	Grade 1	Grade 2
<ol style="list-style-type: none"> <li>1. Students analyze, construct, and operate models in order to discover attributes of the real thing.</li> <li>2. Students discover that a model of something is different from the real thing but can be used to study the real thing.</li> <li>3. Students use different types of models, such as graphs, sketches, diagrams, and maps, to represent various aspects of the real world.</li> </ol>	<ol style="list-style-type: none"> <li>1. Students analyze, construct, and operate models in order to discover attributes of the real thing.</li> <li>2. Students discover that a model of something is different from the real thing but can be used to study the real thing.</li> <li>3. Students use different types of models, such as graphs, sketches, diagrams, and maps, to represent various aspects of the real world.</li> </ol>	<ol style="list-style-type: none"> <li>1. Students analyze, construct, and operate models in order to discover attributes of the real thing.</li> <li>2. Students discover that a model of something is different from the real thing but can be used to study the real thing.</li> <li>3. Students use different types of models, such as graphs, sketches, diagrams, and maps, to represent various aspects of the real world.</li> </ol>
Grade 3		Grade 4
<ol style="list-style-type: none"> <li>1. Students analyze, construct, and operate models in order to discover attributes of the real thing.</li> <li>2. Students discover that a model of something is different from the real thing but can be used to study the real thing.</li> <li>3. Students use different types of models, such as graphs, sketches, diagrams, and maps, to represent various aspects of the real world.</li> </ol>		<ol style="list-style-type: none"> <li>1. Students analyze, construct, and operate models in order to discover attributes of the real thing.</li> <li>2. Students discover that a model of something is different from the real thing but can be used to study the real thing.</li> <li>3. Students use different types of models, such as graphs, sketches, diagrams, and maps, to represent various aspects of the real world.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 6: Interconnectedness: Common Themes** Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning. (MST-6)

## INTERCONNECTEDNESS: COMMON THEMES

**Key Idea: I.6.3 Magnitude and Scale** The grouping of magnitudes of size, time, frequency, and pressures or other units of measurements into a series of relative order provides a useful way to deal with the immense range and the changes in scale that affect the behavior and design of systems.

<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
<ol style="list-style-type: none"> <li>Students provide examples of natural and manufactured things that belong to the same category yet have very different sizes, weights, ages, speeds, and other measurements.</li> <li>Students identify the biggest and the smallest values as well as the average value of a system when given information about its characteristics and behavior.</li> </ol>	<ol style="list-style-type: none"> <li>Students provide examples of natural and manufactured things that belong to the same category yet have very different sizes, weights, ages, speeds, and other measurements.</li> <li>Students identify the biggest and the smallest values as well as the average value of a system when given information about its characteristics and behavior.</li> </ol>	<ol style="list-style-type: none"> <li>Students provide examples of natural and manufactured things that belong to the same category yet have very different sizes, weights, ages, speeds, and other measurements.</li> <li>Students identify the biggest and the smallest values as well as the average value of a system when given information about its characteristics and behavior.</li> </ol>
<b>Grade 3</b>		<b>Grade 4</b>
<ol style="list-style-type: none"> <li>Students provide examples of natural and manufactured things that belong to the same category yet have very different sizes, weights, ages, speeds, and other measurements.</li> <li>Students identify the biggest and the smallest values as well as the average value of a system when given information about its characteristics and behavior.</li> </ol>		<ol style="list-style-type: none"> <li>Students provide examples of natural and manufactured things that belong to the same category yet have very different sizes, weights, ages, speeds, and other measurements.</li> <li>Students identify the biggest and the smallest values as well as the average value of a system when given information about its characteristics and behavior.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 6: Interconnectedness: Common Themes** Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning. (MST-6)

## INTERCONNECTEDNESS: COMMON THEMES

<p><b>Key Idea: I.6.4 Equilibrium and Stability</b> Equilibrium is a state of stability due either to a lack of changes (static equilibrium) or a balance between opposing forces (dynamic equilibrium).</p>		
<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
<ol style="list-style-type: none"> <li>1. Students cite examples of systems in which some features stay the same while other features change.</li> <li>2. Students distinguish between reasons for stability - from lack of changes to changes that counterbalance one another to changes within cycles.</li> </ol>	<ol style="list-style-type: none"> <li>1. Students cite examples of systems in which some features stay the same while other features change.</li> <li>2. Students distinguish between reasons for stability - from lack of changes to changes that counterbalance one another to changes within cycles.</li> </ol>	<ol style="list-style-type: none"> <li>1. Students cite examples of systems in which some features stay the same while other features change.</li> <li>2. Students distinguish between reasons for stability - from lack of changes to changes that counterbalance one another to changes within cycles.</li> </ol>
<b>Grade 3</b>		<b>Grade 4</b>
<ol style="list-style-type: none"> <li>1. Students cite examples of systems in which some features stay the same while other features change.</li> <li>2. Students distinguish between reasons for stability - from lack of changes to changes that counterbalance one another to changes within cycles.</li> </ol>		<ol style="list-style-type: none"> <li>1. Students cite examples of systems in which some features stay the same while other features change.</li> <li>2. Students distinguish between reasons for stability - from lack of changes to changes that counterbalance one another to changes within cycles.</li> </ol>
<p><b>Key Idea: I.6.5 Patterns of Change</b> Identifying patterns of change is necessary for making predictions about future behavior and conditions.</p>		
<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
<ol style="list-style-type: none"> <li>1. Students use simple instruments to measure such quantities as distance, size, and weight and look for patterns in the data.</li> <li>2. Students analyze data by making tables and graphs and looking for patterns of change.</li> </ol>	<ol style="list-style-type: none"> <li>1. Students use simple instruments to measure such quantities as distance, size, and weight and look for patterns in the data.</li> <li>2. Students analyze data by making tables and graphs and looking for patterns of change.</li> </ol>	<ol style="list-style-type: none"> <li>1. Students use simple instruments to measure such quantities as distance, size, and weight and look for patterns in the data.</li> <li>2. Students analyze data by making tables and graphs and looking for patterns of change.</li> </ol>
<b>Grade 3</b>		<b>Grade 4</b>
<ol style="list-style-type: none"> <li>1. Students use simple instruments to measure such quantities as distance, size, and weight and look for patterns in the data.</li> <li>2. Students analyze data by making tables and graphs and looking for patterns of change.</li> </ol>		<ol style="list-style-type: none"> <li>1. Students use simple instruments to measure such quantities as distance, size, and weight and look for patterns in the data.</li> <li>2. Students analyze data by making tables and graphs and looking for patterns of change.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 6: Interconnectedness: Common Themes** Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning. (MST-6)

## INTERCONNECTEDNESS: COMMON THEMES

**Key Idea: I.6.6 Optimization** In order to arrive at the best solution that meets criteria within constraints, it is often necessary to make trade-offs.

<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
<ol style="list-style-type: none"> <li>1. Students determine the criteria and constraints of simple decision-making problems.</li> <li>2. Students use simple quantitative methods, such as ratios, to compare costs to benefits of a decision problem.</li> </ol>	<ol style="list-style-type: none"> <li>1. Students determine the criteria and constraints of simple decision-making problems.</li> <li>2. Students use simple quantitative methods, such as ratios, to compare costs to benefits of a decision problem.</li> </ol>	<ol style="list-style-type: none"> <li>1. Students determine the criteria and constraints of simple decision-making problems.</li> <li>2. Students use simple quantitative methods, such as ratios, to compare costs to benefits of a decision problem.</li> </ol>
<b>Grade 3</b>		<b>Grade 4</b>
<ol style="list-style-type: none"> <li>1. Students determine the criteria and constraints of simple decision-making problems.</li> <li>2. Students use simple quantitative methods, such as ratios, to compare costs to benefits of a decision problem.</li> </ol>		<ol style="list-style-type: none"> <li>1. Students determine the criteria and constraints of simple decision-making problems.</li> <li>2. Students use simple quantitative methods, such as ratios, to compare costs to benefits of a decision problem.</li> </ol>

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 7: Interdisciplinary Problem Solving** Students will apply the knowledge and thinking skills of mathematics, science and technology to address real-life problems and make informed decisions. (MST-7)

## INTERDISCIPLINARY PROBLEM SOLVING

**Key Idea: IPS.7.1 Connections** The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/technology/society, consumer decision making, design, and inquiry into phenomena.

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
<ol style="list-style-type: none"> <li>1. Students analyze science/technology/society problems and issues that affect their home, school, or community, and carry out a remedial course of action.</li> <li>2. Students make informed consumer decisions by applying knowledge about the attributes of particular products and making cost/benefit tradeoffs to arrive at an optimal choice.</li> <li>3. Students design solutions to problems involving a familiar and real context, investigate related science concepts to inform the solution, and use mathematics to model, quantify, measure, and compute.</li> <li>4. Students observe phenomena and evaluate them scientifically and mathematically by conducting a fair test of the effect of variables and using mathematical knowledge and technological tools to collect, analyze, and present data and conclusions.</li> </ol>				

**Key Idea: IPS.7.2 Strategies** Solving interdisciplinary problems involves a variety of skills and strategies, including effective work habits, gathering and processing information; generating and analyzing ideas; realizing ideas; making connections among the common themes of mathematics, science, and technology; and presenting results.

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
<p>Students participate in an extended, culminating mathematics, science, and technology project. The project would require students to:</p> <ul style="list-style-type: none"> <li>• work effectively</li> <li>• gather and process information</li> <li>• generate and analyze ideas</li> <li>• observe common themes</li> <li>• realize ideas</li> <li>• present results</li> </ul>				

# SCIENCE: K-4 Elementary Scope and Sequence

**NYS Standard 7: Interdisciplinary Problem Solving** Students will apply the knowledge and thinking skills of mathematics, science and technology to address real-life problems and make informed decisions. (MST-7)

## INTERDISCIPLINARY PROBLEM SOLVING

<b>Key Idea: IPS.7.3 Skills and Strategies for Interdisciplinary Problem Solving</b>				
<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>	<b>Grade 3</b>	<b>Grade 4</b>
<p><b>Working Effectively:</b> Contributing to the work of a brainstorming group, laboratory partnership, cooperative learning group, or project team; planning procedures; identify and managing responsibilities of team members; and staying on task, whether working alone or as part of a group.</p> <p><b>Gathering and Processing Information:</b> Accessing information from printed media, electronic data bases, and community resources and using the information to develop a definition of the problem and to research possible solutions.</p> <p><b>Generating and Analyzing Ideas:</b> Developing ideas for proposed solutions, investigating ideas, collecting data, and showing relationships and patterns in the data.</p> <p><b>Common Themes:</b> Observing examples of common unifying themes, applying them to the problem, and using them to better understand the dimensions of the problem.</p> <p><b>Realizing Ideas:</b> Constructing components or models, arriving at a solution, and evaluating the result.</p> <p><b>Presenting Results:</b> Using a variety of media to present the solution and to communicate the results.</p>				