

Science Curriculum Guide



Kindergarten

Kindergarten Science: First Nine Weeks

VA Standards of Learning (SOL) Essential Understandings	Content Knowledge and Skills	MCPS Adopted Materials	Supporting Materials
<p>K.1 Scientific Investigation</p> <p>The concepts developed in this standard include the following:</p> <ul style="list-style-type: none"> • Observation is an important way to learn about the world. Through observation one can learn to compare, contrast, and note similarities and differences. • Observations can be communicated through pictures and discussions. • Observations about familiar objects or events often lead to the development of important questions that can spark further investigation. • An object can appear very different depending on how it is oriented. To describe an object fully and accurately, it should be observed from several different positions. • Putting objects in a sequence allows one to understand how things are related. A sequence can show how things can change a little at a time. • Picture graphs are useful ways to display and report information. • A nonstandard unit of measure, such as the length of a paper clip, can be used to describe and communicate the dimensions of an object. For the nonstandard unit to be most useful, it should be consistent and easily applied. • It is important to observe the results of an investigation carefully. Results that are unexpected or unusual may be of interest for further study. 	<p>Standard K.1 does not require a discrete unit on scientific investigation because the inquiry skills that make up the standard should be incorporated in all the other kindergarten science standards. Each skill has been connected to specific content within this curriculum guide, but teachers may also provide instruction in any of the skills throughout the school year.</p> <p>In order to meet this standard, it is expected that students should be able to:</p> <ul style="list-style-type: none"> • Observe objects and describe their basic properties. These include color, shape (circle, triangle, square, and rectangle), size (big, little, large, small), texture (rough, smooth, hard, soft), and weight (heavy, light). • Observe an object or objects from multiple positions to achieve different perspectives. In order to accomplish this, the student should look at the object from top, bottom, front, and back. • Arrange a set of objects in sequence according to size. • Separate a set of objects into two groups based on a single physical attribute, including size, color, texture, and weight. • Construct picture graphs using 10 or fewer units. • Measure common objects with nonstandard units. Examples of nonstandard units include hands, pennies, and paper clips. • Predict an unseen member in a sequence of objects to complete a pattern. • Develop a question from one or more observations. • Describe objects both pictorially and verbally. • Identify unusual or unexpected results in an activity. 		<p>Enhanced Scope and Sequence Plus</p> <p>Measure This! p. 35</p> <p>Unusual Events p. 39</p>

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<p>K.6 The student will investigate and understand basic needs and life processes of plants and animals.</p> <p>The concepts developed in this standard include the following:</p> <ul style="list-style-type: none"> Plants and animals change as they grow. Plants and animals need food, water, and gases in the air to live. (Many animals and plants that live in water use the gases that are dissolved in the water.) Plants and animals live and die. This is part of the life cycle. Many offspring of plants and animals are like their parents but not identical to them. 	<p>In order to meet this standard, it is expected that students:</p> <ul style="list-style-type: none"> Describe the life needs of animals and plants. The life needs are food, water, and air. Predict what will happen to animals and plants if life needs are not met. Describe some simple changes animals and plants undergo during the life cycle. For animals this may include changes in color, body covering, and overall size. For plants this may include size, presence of leaves and branches, and ability to produce flowers and fruits. Compare and contrast young plants and animals with their parents, using pictures and/or live organism. Describe how animals and plants change as they grow. <p>Skills</p> <ul style="list-style-type: none"> Basic properties of objects are identified by direct observation. A set of objects is sequenced according to size. An unseen member in a sequence of objects is predicted. 	<p>Text A8-A39 A56-65 B38-57</p> <p>VASOL p. 8-10</p> <p>Activity Cards 17, 18, 19</p> <p>Activity Book p. 43-48</p> <p>Read-Aloud Anthology T50</p> <p>Science Songs Track 4</p>	<p>AIMS <u>Primarily Plants</u> A Seed Grows What do Plants Need to Grow? A Seed Grows</p> <p><u>Cycles of Knowing and Growing</u> Just a Little Sprout A Time of Their Own</p> <p><u>Critters</u> Mealworms on Stage Undercover</p> <p>Enhanced Scope and Sequence Plus Life Cycles p. 84 Plant & Animal Needs p. 90</p>

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<p>K.2 Investigate and understand that humans have senses that allow one to seek, find, take in, and react or respond to information in order to learn about one’s surroundings.</p> <p>The concepts developed in this standard include the following:</p> <ul style="list-style-type: none"> • A particular sensing organ (eyes, ears, nose, tongue, and skin) is associated with each of the five senses. • Using the senses, we can make careful observations about the world and communicate those observations through descriptors. 	<p>In order to meet this standard, it is expected that students:</p> <ul style="list-style-type: none"> • identify and describe the five senses: taste, touch, smell, hearing, and sight. • match each sensing organ (eyes, ears, nose, tongue, and skin) with its associated sense. • match sensory descriptors with the senses (<i>taste</i>: sweet, sour, bitter, salty; <i>touch</i>: smooth, hard, soft, cold, warm, hot; <i>hearing</i>: loud, soft, high, low; <i>sight</i>: bright, dull, color, black, and white.) <p>Skills</p> <ul style="list-style-type: none"> • Basic properties of objects are identified by direct observation. • A set of objects is sequenced according to size. • An unseen member in a sequence of objects is predicted . 	<p>Text T26-29 T30-35</p> <p>Activity Card 1</p> <p>VASOL p. 5-6</p>	<p>AIMS <u>Sense-able Science</u> Home Free Eggstra Special Scramble Touch and Tell Kid Gloves</p> <p><u>Spring Into Math and Science</u> Reach for a Rainbow</p> <p><u>Glide Into Winter with Math and Science</u> Only the Nose Knows Do You Have a Snoot For Fruit</p> <p><u>Primarily Physics</u> Eggs-Full of Sound Traveling Sounds Big Ears</p> <p><u>Bats Incredible</u> Family Sense</p> <p>Enhanced Scope and Sequence Plus: Smell p. 2 Touch p. 9 Sound p. 11 Taste p. 16 Sight p. 20</p>

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<p>K.9 The student will investigate and understand that change occurs over time, and rates may be fast or slow.</p> <p>The concepts developed in this standard include the following:</p> <ul style="list-style-type: none"> • Change occurs over time. • Change can be fast or slow depending upon the object and conditions. • As people grow, they change. • Not all things change at a rate that can be observed easily. • Many changes can be measured. 	<p>In order to meet this standard, it is expected that students:</p> <ul style="list-style-type: none"> • Should be able to identify some changes that people experience over time. e.g., height, weight, and color of hair. • Predict how their own height and weight will change over the school year. • Describe how people cause things to change e.g., demolition of buildings, construction of buildings, cutting down trees, planting trees, and building highways. • Describe how things change naturally. This includes seasonal changes, the growth in seeds and common plants, common animals, including the butterfly, and the weather. • Identify examples of fast changes and slow changes. Slow changes should be the kinds of familiar changes that occur over weeks, months, or seasons. Students are not responsible for long-term changes. <p>Skills</p> <ul style="list-style-type: none"> • Basic properties of objects are identified by direct observation. • A set of objects is sequenced according to size. • An unseen member in a sequence of objects is predicted. 	<p>Text D18-23</p> <p>VASOL p. 13</p>	<p>Enhanced Scope and Sequence Plus: Beanstalk Growing p. 61 All About Me! p. 64</p>

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<p>K.4 The student will investigate and understand that physical properties of an object can be described.</p> <p>The concepts developed in this standard include the following:</p> <ul style="list-style-type: none"> • An object may have many properties that can be observed and described. • Objects can be described readily in terms of color, shape, and texture. • An object can be described according to its position relative to another object and according to its motion. • Two different objects can have some of the same physical properties and some different physical properties. 	<p>In order to meet this standard, it is expected that students should be able to:</p> <ul style="list-style-type: none"> • Identify and name eight basic colors, including red, orange, yellow, green, blue, and purple. (Indigo and violet are not required at the kindergarten level.) Black and white are not spectral colors, but students should recognize them by name. • Identify and name a circle, triangle, square, and rectangle. • Compare and contrast objects that are flexible, stiff, straight, and curved. • Compare and contrast objects that are rough, smooth, hard, and soft. • Compare objects using the concepts of heavy/light, long/short, wide/thin, big/little, and large/small. • Measure objects, using nonstandard units. • Identify the position of an object, using position words over/under, in/out, above/below, and left/right. Group objects according to their speed, fast or slow. • Separate a set of objects into two groups based on a single physical attribute including size, color, texture, and weight. <p>Skills</p> <ul style="list-style-type: none"> • Observations are made from multiple positions to achieve different perspectives. • Objects are described pictorially & verbally. • A set of objects is separated into two groups based on a single attribute. 	<p>Text C34-37 E8-37 E46-53</p> <p>VASOL p. 15-22</p> <p>Activity Cards 35-37</p> <p>Activity Book p. 85-90</p> <p>Read-Aloud Anthology p. T52</p> <p>Take-Home Book AB91-92</p> <p>Science Instant Reader and CD-ROM Centers p. E31</p>	<p>AIMS <u>Primarily Physics</u> I Love Color</p> <p><u>Sense-able Science</u> Color My World Bags of Beads</p> <p><u>Fall Into Math and Science</u> Shape Up</p> <p><u>Primarily Bears</u> Gummy Bears Let me Count the Ways</p> <p><u>Primarily Earth</u> My Rock</p> <p><u>Under Construction</u> Mitts for Kits</p> <p><u>Spring Into Math and Science</u> Feet Findings</p> <p>Enhanced Scope and Sequence Plus Animal Adventures p. 25 Sorting p. 28 What’s Your Sport? p. 31</p>

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<p>K.5 The student will investigate and understand that water flows and has properties that can be observed and tested.</p> <p>The concepts developed in this standard include the following:</p> <ul style="list-style-type: none"> • Water can be a solid, liquid, or gas. • The state of water can be changed by heating or cooling it. • The natural flow of water is from a higher to a lower level. • Some objects float in water, while others do not. 	<p>In order to meet this standard, it is expected that students should be able to:</p> <ul style="list-style-type: none"> • Identify examples of the different states of water (solid, liquid, and gas). • Classify examples of different states of matter as solid, liquid, or gas. • Describe the natural flow of water. • Predict where a stream of water will flow. • Predict whether items will float or sink when placed in water. Items to use include wood, metal, fruits, paper, and plastics. <p>Skills</p> <ul style="list-style-type: none"> • Observations are made from multiple positions to achieve different perspectives. • Objects are described pictorially & verbally. • A set of objects is separated into two groups based on a single attribute. 	<p>Text C40-45 F 8-11 F16-35</p> <p>Activity Cards 42-44 46</p> <p>Activity Book 103-108 111-112</p> <p>VASOL p. 23-24</p> <p>“Sink or Float” game T47</p> <p>Science Songs Track 16</p>	<p>AIMS <u>Spring into Math and Science</u> Floating Fruit What Do you Sink Will Float</p> <p><u>Primarily Earth</u> Water to Ice to Water Where is Water</p> <p><u>Primarily Physics</u> Melt A Cube</p> <p><u>Water Precious Water</u> A Little Cup Will Do It</p> <p>Enhanced Scope and Sequence Plus Sink or Float? p. 43 Solid, Liquid, or Gas p. 47</p>

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<p>K.3 The student will investigate and understand that magnets have an effect on some materials, make some things move without touching them, and have useful application.</p> <p>The concepts developed in this standard include the following:</p> <ul style="list-style-type: none"> • Magnets will attract certain metals (iron-bearing, nickel, and cobalt). • Magnets have an effect on some items and can cause them to move. Some items are not affected by magnets and remain stationary. • Because some metals are attracted to magnets, magnets have many simple useful applications in the home. • The force of a magnet can move something without actually touching it. • Repulsion is the force that pushes like poles of magnets apart. 	<p>In order to meet this standard, it is expected that students should be able to:</p> <ul style="list-style-type: none"> • Predict and test which common objects will be attracted to magnets and which will not be attracted to magnets. • Classify objects as being attracted or not attracted to magnets, such as iron nail, iron-bearing paper clip, cereal, and book. • Explain in their own words essential vocabulary, including the concepts of attraction/nonattraction, push/pull, attract/repel, and metal/nonmetal. • Identify items in the home that contain a magnet or magnets, such as can openers, magnetized screwdrivers, magnetic games, and refrigerator magnets. • Evaluate the importance and usefulness of magnets in the home. <p>Skills</p> <ul style="list-style-type: none"> • A question is developed from one or more observations. • Unusual or unexpected results in an activity are recognized. 	<p>Text T34-35</p> <p>Activity Card 40, 41</p> <p>Activity Book p. 97-100</p> <p>Read-Aloud Anthology p. T53</p>	<p>AIMS <u>Mostly Magnets</u> Stick to It What Will A Magnet Attract</p> <p>Enhanced Scope and Sequence Plus Magnet Madness p. 78</p>

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<p>K.8 The student will investigate and understand simple patterns in his/her daily life.</p> <p>The concepts developed in this standard include the following:</p> <ul style="list-style-type: none"> • One can make simple predictions in weather patterns. On a cloudy, warm day, it may rain. On a cloudy day that is very cold, it may snow. On a clear day there most likely will be no rain or snow. • As animals and plants grow, they get larger according to a pattern. • Natural objects such as leaves, seeds, and cones have patterns we can see. • Home and school routines frequently follow a pattern. 	<p>In order to meet this standard, it is expected that students should be able to:</p> <ul style="list-style-type: none"> • Observe and identify daily weather conditions sunny, rainy, cloudy, snowy, windy, warm, hot, cool, and cold. • Predict daily weather based on basic observable conditions. • Chart daily weather conditions. • Identify simple patterns in natural objects such as veins in a leaf, spiral patterns in cones, shapes and colors of common seeds. • Identify and describe patterns in their daily schedule at home. • Identify and describe patterns in their daily schedule at school. • Distinguish between the patterns in home activities and those in school activities. • Describe how animals and plants change as they grow. <p>Skills</p> <ul style="list-style-type: none"> • A question is developed from one or more observations. • Unusual or unexpected results in an activity are recognized. 	<p>Text B8-23 D8-15 D24-55 T28-29 T35-36</p> <p>VASOL p. 11-12</p> <p>Activity Card 13, 15</p> <p>Activity Book p. 35-36 p. 39-40</p> <p>Read-Aloud Anthology T50</p>	<p>AIMS <u>Primarily Earth</u> Watching the Weather</p> <p><u>Primarily Plants</u> Seed Sort The Seed Within Observe a Leaf</p> <p><u>Fall Into Math and Science</u> Fall Leafs Me Happy</p> <p>Enhanced Scope and Sequence Plus Patterns p. 71 Weather Patterns p. 74</p>

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<p>K.7 The student will investigate and understand that shadows occur when light is blocked by an object.</p> <p>The concepts developed in this standard include the following:</p> <ul style="list-style-type: none"> • A shadow is an image of an object created when light is blocked by that object. • Shadows can occur whenever light is present. • People can make shadows. • Living and nonliving things can make shadows. 	<p>In order to meet this standard, it is expected that students should be able to:</p> <ul style="list-style-type: none"> • Identify a shadow or variety of shadows. • Describe how to make a shadow. • Identify and describe sources of light such as sun, electric lights, and flashlights that can produce shadows. • Match objects with the shadow they would create. • Analyze how shadows change as the direction of the light source changes. <p>Skills</p> <ul style="list-style-type: none"> • A question is developed from one or more observations. • Unusual or unexpected results in an activity are recognized. 	<p>Text E38-45</p> <p>Activity Card 39</p> <p>Activity Book p. 95-96</p> <p>Read-aloud Anthology p. T53</p>	<p>AIMS <u>Cycles of Knowing and Growing</u> Mr. Groundhog, Mr. Groundhog</p> <p>Enhanced Scope and Sequence Plus Sun and Shadows p. 56</p>

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<p>K.10 The student will investigate and understand that materials can be reused, recycled, and conserved.</p> <p>The concepts developed in this standard include the following:</p> <ul style="list-style-type: none"> • A shadow is an image of an object created when light is blocked by that object. • Shadows can occur whenever light is present. • People can make shadows. • Living and nonliving things can make shadows. 	<p>In order to meet this standard, it is expected that students should be able to:</p> <ul style="list-style-type: none"> • Identify a shadow or variety of shadows. • Describe how to make a shadow. • Identify and describe sources of light such as sun, electric lights, and flashlights that can produce shadows. • Match objects with the shadow they would create. • Analyze how shadows change as the direction of the light source changes. <p>Skills</p> <ul style="list-style-type: none"> • Nonstandard units are used to measure common objects. • Picture graphs are constructed using 10 or fewer units. 	<p>Text C46-53 C54-63</p>	<p>AIMS <u>Water Precious Water</u> A Little Cup Will Do It Drip Drop Flip Flop</p> <p><u>Primarily Earth</u> Where is Water The Earth's Has What We Need</p> <p>Enhanced Scope and Sequence Plus Recycling p. 97</p>