

**2nd Grade Science Curriculum Guide
Lunenburg County Public Schools
June 2014**

Marking Period: 1st Nine Weeks

Days: ongoing

Reporting Category/Strand: Scientific Investigation, Reasoning, and Logic

<p>SOL 2.1</p>		<p>The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which</p> <ul style="list-style-type: none"> a) observations and predictions are made and questions are formed; b) observations are differentiated from personal interpretation; c) observations are repeated to ensure accuracy; d) two or more characteristics or properties are used to classify items; e) length, volume, mass, and temperature are measured in metric units and standard English units using the proper tools; f) time is measured using the proper tools; g) conditions that influence a change are identified and inferences are made; h) data are collected and recorded, and bar graphs are constructed using numbered axes; i) data are analyzed, and unexpected or unusual quantitative data are recognized; j) conclusions are drawn; k) observations and data are communicated; l) simple physical models are designed and constructed to clarify explanations and show relationships; and m) current applications are used to reinforce science concepts.
<p>Essential Knowledge/Skills/Understandings</p>		<p>Essential Knowledge and Skills In order to meet this standard, it is expected that students will</p> <ul style="list-style-type: none"> ● conduct simple experiments, make predictions, gather data from those experiments, repeat observations to improve

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		<p>accuracy, and draw conclusions.</p> <ul style="list-style-type: none"> ● differentiate among simple observations and personal interpretations. ● classify items, using two or more attributes such as size, shape, color, texture, and weight. ● use centimeters, meters, liters, degrees Celsius, grams, and kilograms in measurement. ● use inches, feet, yards, quarts, gallons, degrees Fahrenheit, ounces, and pounds in measurement. ● measure time using both digital and analog clocks. ● identify conditions that influence a change in an experiment. ● construct and interpret simple models (e.g., weathering and erosion of land surfaces — 2.7).
Essential Questions		<ul style="list-style-type: none"> ● Demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations
Primary Resources		<p>Websites http://www.brainpop.com/</p> <p>Books Magic School Bus and the Science Fair Expedition, by Joanna Cole and Bruce Degen</p>
Essential Vocabulary		<p>evidence- Scientists develop their ideas based on evidence and they change their ideas when new evidence becomes available or the old evidence is viewed in a different way.</p>

Marking Period: 1st Nine Weeks

Days: 10

Reporting Category/Strand: Interrelationships in Earth/Space Systems

SOL 2.6	<p>The student will investigate and understand basic types, changes, and patterns of weather. Key concepts include</p> <p>a) identification of common storms and other weather phenomena;</p>
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	<p>b) the uses and importance of measuring, recording, and interpreting weather data; and</p> <p>c) the uses and importance of tracking weather data over time.</p>
<p>Essential Knowledge/Skills/Understandings</p>	<p>Essential Knowledge and Skills In order to meet this standard, it is expected that students will</p> <ul style="list-style-type: none"> ● observe and describe seasonal weather patterns and local variations. ● observe and record daily weather conditions, such as sunny, cloudy, windy, rainy, or snowy. ● record and interpret daily temperature, using a graph with numbered axes. ● measure and record weather data, using weather instruments, including a thermometer, rain gauge, and weather vane (standard English and metric measures). ● describe weather in terms of temperature, wind, and precipitation. ● observe and describe precipitation in terms of evaporation and condensation of water. ● observe and describe types of precipitation, including rain, snow, and ice (sleet and hail). ● describe how tracking weather data over time helps scientists make future weather predictions. ● evaluate the influence of daily weather conditions on personal activities and dress. ● identify common types of storms. Examples include hurricanes, tornadoes, blizzards, and thunderstorms. ● compare and contrast droughts and floods.
<p>Essential Questions</p>	<ul style="list-style-type: none"> ● How is weather tracked over time? ● What is the use and importance of measuring, recording, and interpreting weather data? ● What type or storm or weather phenomena?
<p>Primary Resources</p>	<p>Textbook Correlations McGraw-Hill Science; Weather and Other Earth Changes, C2-C27</p> <p>Websites http://www.brainpop.com/</p> <p>Lesson Plans VDOE Weather</p> <p>Books <u>Lightning:by Seymour Simon</u> <u>Storms:by Seymour Simon</u> <u>Tornadoes:by Seymour Simon</u> <u>Weather:by Seymour Simon</u></p>

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	<p>Weather Words and What They Mean, By Gail Gibbson</p> <p>Videos The Four Seasons Weather Start: Storms</p>
Essential Vocabulary	<p>weather- characterized by daily differences in wind, temperature, and precipitation. precipitation- when water, previously evaporated, condenses out of the air and changes its phase from a gas to a liquid (rain) or to a solid (snow or sleet). drought- such as too little precipitation storms- have powerful winds, which may be accompanied by rain, snow, or other kinds of precipitation. weather instruments- instrument used to predict weather and determining weather patterns. trends- Scientists collect weather data over time to study trends and patterns.</p>

Marking Period: 1st Nine Weeks

Days: 10

Reporting Category/Strand: Matter

SOL 2.3	<p>The student will investigate and understand basic properties of solids, liquids, and gases. Key concepts include</p> <p>a) identification of distinguishing characteristics of solids, liquids, and gases; b) measurement of the mass and volume of solids and liquids; and c) changes in phases of matter with the addition or removal of energy.</p>
Essential Knowledge/Skills/Understandings	<p>Essential Knowledge and Skills In order to meet this standard, it is expected that students will</p> <ul style="list-style-type: none"> ● classify materials as to whether they are liquids, solids, or gases. ● describe and identify examples of condensation, evaporation, melting, and freezing of water. ● measure the mass of solids and the volume of liquids in metric and standard English units. ● examine and describe the transformation of matter from one phase to another, i.e., solid water (ice) to liquid (water) to gas (water vapor). ● conduct an investigation to observe the condensation of water. ● design and conduct an investigation to determine basic factors that affect the evaporation of water. ● identify the phases of water and the uses of water in its various phases in the home and at school.

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Essential Questions	<ul style="list-style-type: none"> • What are the distinguishing characteristics of solids, liquids, and gases?
Primary Resources	<p>Textbook Correlations McGraw-Hill Science; Matter and Energy, E1-E35</p> <p>Websites http://www.brainpop.com/</p> <p>Lesson Plans VDOE Matter VDOE Mass and Volume</p> <p>Books States of Matter, by Fiona, Bayrock Matter: Solids, Liquids, and Gases, by Mir Tamim Ansary Solids, Liquids and Gases, by Ontario Science Centre</p> <p>Videos Properties of Matter, Part 1 Properties of Matter, Part 2: Liquid, Solids, and Gases</p>
Essential Vocabulary	<p>matter- is anything that has mass and takes up space. solids- have a defined shape and volume. liquids- have a definite volume and take the shape of the container. gases- will completely fill any closed container (take the shape of its container) and assume the volume of its container. (e.g., Helium gas put into a balloon takes the shape of the balloon because the balloon defines its shape.) volume- is the measure of the amount of space occupied by matter.</p>

Marking Period: 2nd Nine Weeks

Days: 10

Reporting Category/Strand: Force, Motion, and Energy

SOL 2.2	The student will investigate and understand that natural and artificial magnets have certain characteristics and attract specific types of metals. Key concepts include
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	<p>a) magnetism, iron, magnetic/non-magnetic, poles, attract/repel; and</p> <p>b) important applications of magnetism.</p>
<p>Essential Knowledge/Skills/Understandings</p>	<p>Essential Knowledge and Skills In order to meet this standard, it is expected that students will</p> <ul style="list-style-type: none"> ● identify the north and south magnetic poles of magnets. ● use magnetic compasses to determine the directions of north and south poles. ● predict which materials will be attracted to magnets, test the predictions, and create a chart that shows the results, classifying materials as to whether they are attracted to magnets or not. ● conduct an investigation to determine how the different poles of magnets react to the poles of other magnets. ● identify important applications of magnets in everyday life: <ul style="list-style-type: none"> ○ refrigerator magnets and chalkboard letters ○ toys ○ door latches ○ paper clip holders ○ computers ○ motors ○ credit card magnetic strips. ● compare natural magnets (lodestone or magnetite) and artificial magnets. ● create a new application for using a magnet.
<p>Essential Questions</p>	<ul style="list-style-type: none"> ● What are the important applications of magnets? ● What is attracted/repelled to magnets?
<p>Primary Resources</p>	<p>Textbook Correlations McGraw-Hill Science; All About Magnets, F36-F53</p> <p>Websites http://www.brainpop.com/</p> <p>Lesson Plans VDOE Magnets and Magnetism</p> <p>Books Magnets, by Karen Bryant-Mole Magnets: Magic Forces by, Jim Pipe</p>

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	<p>Magnets by Wiley Blevins</p> <p>Videos A First Look: Magnets The Magic of Magnetism</p>
Essential Vocabulary	<p>magnets- can attract objects made of iron, nickel, or cobalt magnetic compass- always points roughly toward Earth's North Pole and the south end of the compass needle always points toward Earth's South Pole</p>

Marking Period: 2nd Nine Weeks

Days: 10

Reporting Category/Strand: Earth Patterns, Cycles, and Change

SOL 2.7	<p>The student will investigate and understand that weather and seasonal changes affect plants, animals, and their surroundings. Key concepts include</p> <p>a) effects of weather and seasonal changes on the growth and behavior of living things; and</p> <p>b) weathering and erosion of land surfaces.</p>
Essential Knowledge/Skills/Understandings	<p>Essential Knowledge and Skills</p> <p>In order to meet this standard, it is expected that students will</p> <ul style="list-style-type: none"> ● identify growth and behavioral responses of plants and animals to weather and seasonal changes. Examples of responses that are adaptive include migration, hibernation, camouflage, and dormancy. ● identify animals that migrate, hibernate, or show other changes throughout the seasons or in the presence of adverse environmental conditions. ● evaluate the usefulness of camouflage in an animal's habitat (for example, coloration patterns of frogs). ● compare and contrast the responses of plants and animals to weather and seasonal changes. ● model the effects of weathering and erosion on the land surface.
Essential Questions	<ul style="list-style-type: none"> ● What are the effects of weather and seasonal changes on the growth and behavior of living things? ● What are the effects of weathering and erosion on the land surface?
Primary Resources	Textbook Correlations

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	<p>McGraw-Hill Science; Weather and Other Earth Changes, C2-C27</p> <p>Websites http://www.brainpop.com/</p> <p>Lesson Plans VDOE Seasons and Changes</p> <p>Videos Our Changing Earth Weathering and Erosion</p>
Essential Vocabulary	<p>weathering- is the breaking down of rocks, which usually happens over long periods of time.</p> <p>erosion- is the process by which the products of weathering are moved from one place to another. Erosion may happen quickly (e.g., during a flood or a hurricane) or over a long period of time.</p>

Marking Period: 3rd Nine Weeks

Days: 20

Reporting Category/Strand: Living Systems

SOL 2.5	<p>The student will investigate and understand that living things are part of a system. Key concepts include</p> <p>a) living organisms are interdependent with their living and nonliving surroundings;</p> <p>b) an animal’s habitat includes adequate food, water, shelter or cover, and space;</p> <p>c) habitats change over time due to many influences; and</p> <p>d) fossils provide information about living systems that were on Earth years ago.</p>
Essential Knowledge/Skills/Understandings	<p>Essential Knowledge and Skills</p> <p>In order to meet this standard, it is expected that students will</p> <ul style="list-style-type: none"> ● classify objects as to whether they are living or nonliving. ● describe the basic components of an animal habitat (food, water, shelter or cover, and space). ● classify the parts of an animal’s habitat as living or nonliving. ● construct and interpret simple models of different kinds of habitats, including a forest and a stream.

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	<ul style="list-style-type: none"> ● predict and describe seasonal changes in habitat and their effects on plants and animals, for example, how trees change through the seasons and how animals respond to changes in the seasons. ● describe how animals are dependent on their surroundings, for example, how squirrels and other animals are affected by the loss of forest habitat. ● describe how scientists use the study of fossils to show past weather/climate conditions and environmental characteristics.
Essential Questions	<ul style="list-style-type: none"> ● What is a habitat? ● How are habitats changed or affected? ● What information do fossils provide about the Earth years ago?
Primary Resources	<p>Textbook Correlations McGraw-Hill Science; Homes for Plants and Animals, B2-B53</p> <p>Websites http://www.brainpop.com/</p> <p>Lesson Plans VDOE Habitats VDOE Fossils</p> <p>Videos Biomes and Habitats Habitats: Home for Living Things Ocean Habitat: Shoreline and Reef Reading Rainbow: Digging up Dinosaurs</p>
Essential Vocabulary	<p>habitat- includes adequate food, water, shelter or cover, and space; habitats change over time due to many influences</p> <p>fossils- provide information about living systems that were on Earth years ago</p>

Marking Period: 4th Nine Weeks

Days: 10

Reporting Category/Strand: Earth Resources

SOL 2.8	The student will investigate and understand that plants produce oxygen and food, are a source of useful products, and provide benefits in nature. Key concepts include
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	<p>a) important plant products are identified and classified;</p> <p>b) the availability of plant products affects the development of a geographic area;</p> <p>c) plants provide oxygen, homes, and food for many animals; and</p> <p>d) plants can help reduce erosion.</p>
Essential Knowledge/Skills/Understandings	<p>Essential Knowledge and Skills In order to meet this standard, it is expected that students will</p> <ul style="list-style-type: none"> ● understand that plants produce oxygen and food. ● classify and identify the sources and uses of plant products, such as fiber, cotton, oil, spices, lumber, rubber, medicines, and paper. ● describe how the availability of certain plant products in a geographic area would affect the development of that area. ● describe plant products grown in Virginia that are useful to people, including wood, fruits, and vegetables. List and classify plant products (e.g., peanuts, cotton, soybeans, apples, evergreens). ● compare and contrast different ways animals use plants as homes and shelters. ● construct and interpret a chart illustrating the plant foods consumed by different animals. ● construct and interpret a model that demonstrates how plants reduce soil erosion.
Essential Questions	<ul style="list-style-type: none"> ● How are plants used?
Primary Resources	<p>Websites http://www.brainpop.com/</p> <p>Videos The Language of Science: Life Science K-12: Plants</p>
Essential Vocabulary	<p>living organisms- are interdependent with their living and nonliving surroundings</p>

Marking Period: 4th Nine Weeks

Days: 10

Reporting Category/Strand: Life Processes

SOL 2.4	The student will investigate and understand that plants and animals undergo a series of orderly changes as they mature and grow. Key concepts include
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	<p>a) animal life cycles; and b) plant life cycles.</p>
Essential Knowledge/Skills/Understandings	<p>Essential Knowledge and Skills</p> <p>In order to meet this standard, it is expected that students will</p> <ul style="list-style-type: none"> ● describe changes in the life cycles of a butterfly and a white-tailed deer. ● compare and contrast life cycles of a butterfly and a white-tailed deer. ● identify the stages in the life cycle of a flowering plant. ● construct and interpret models/diagrams of animal and plant life cycles.
Essential Questions	<ul style="list-style-type: none"> ● What are the life cycles of various animals and plants?
Primary Resources	<p>Textbook Correlations McGraw-Hill Science; Plants and Animals, A1-A53</p> <p>Websites http://www.brainpop.com/</p> <p>Books Waiting for Winds, by Lois Ehlert</p> <p>Videos Plant Life Cycles Animal Life Cycles</p>
Essential Vocabulary	<p>life cycle- plants and animals undergo a series of orderly changes as they mature and grow</p> <p>dormancy- is a state of reduced metabolic activity adopted by many organisms (both plants and animals) under conditions of environmental stress or when such stressful conditions are likely to appear, such as in winter.</p>