

SENECA VALLEY SCHOOL DISTRICT

CURRICULUM

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| Course Title: | Science |
| Grade Level(s): | 4 |
| Periods Per Week: | 5 |
| Length of Period: | 40 Minutes |
| Length of Course: | Full Year |
| Faculty Author(s): | Leah McDowell, Sandy Thompson, Autumn Power-Boylan |
| Date: | May 2, 2012 |

COURSE DESCRIPTION:

Science instruction in the SVSD will be based on inquiry-based learning process in a developmentally appropriate method using a learning cycle. At the 4th grade level students will be actively engaged in learning related to life cycles and habitats, water cycle and erosion, forces and motion, and food and nutrition.

The state has developed anchors (points of focus) in Science. The anchors specify eligible content for the content areas. The anchors include standards 1.1, 1.2, and 1.3

The Objectives that address anchors have been bolded.

The following outline provides a general overview of the course content, not a chronological timetable. The weeks denoted for each area provide an idea for the overall time spent working with a given topic throughout the school year.

| COURSE OUTLINE | OBJECTIVES (PA standard) | | | |
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| <p>I. Earth Science</p> <p>I. Matter</p> <p>A. Physical Change</p> <p>1. Water Cycle</p> <p>a. Evaporation</p> <p>i. Transpiration</p> <p>b. Condensation</p> <p>c. Precipitation</p> <p>d. Runoff</p> <p>e. Ground Water</p> <p>2. Land</p> <p>a. Erosion</p> <p>b. Deposition</p> <p>c. Sedimentation</p> <p>B. Physical Properties</p> <p>1. Soil components</p> <p>a. Porosity (pore space)</p> <p>b. Permeability</p> <p>2. Bodies of Water</p> <p>a. Streams</p> <p>b. Rivers</p> <p>c. Lakes</p> <p>d. Tributaries</p> <p>e. Oceans</p> <p>3. Landforms</p> <p>a. Glaciers</p> <p>b. Canyons</p> <p>c. Deltas</p> <p>C. Scientific Processes</p> <p>1. Design and Conduct Investigation</p> | <p>Record direct observations and use them to draw conclusions to differentiate fact from opinion. S4.A.1.1.1</p> <p>Design, create, and revise models that describe the improvements of technology and their impact. S4.A.1.1.2</p> <p>Demonstrate and explain physical changes resulting from heat, cold, or light. S4.A.1.3.5</p> <p>Demonstrate how human activities may change the environment. S4.A.1.3.5</p> <p>Utilize and evaluate various strategies to generate scientific questions. S4.A.2.1.1</p> <p>Create and evaluate the fairness of an investigation that tests one variable. S4.A.2.1.3</p> <p>Evaluate recorded observations of natural phenomenon to make predictions. S4.A.2.1.3</p> <p>Evaluate the information and data collected to formulate a conclusion. S4.A.2.1.4</p> <p>Describe evidence from investigations and use it to defend conclusions. S4.A.2.1.5</p> <p>Select appropriate tool or instruments for specific tasks based on the information the tool can provide. S4.A.2.2.1</p> <p>Classify systems as either natural or human made. S4.A.3.1.1</p> <p>Describe what different models represent. S4.A.3.2.1</p> <p>Create and explain models to demonstrate how systems work. S4.A.3.2.2</p> <p>Design and construct models to illustrate a system. S4.A.3.2.3</p> <p>Locate, record, and explain observable patterns. S4.A.3.3.1</p> | | | |

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| <p>a. Observations b. Inferences c. Variables</p> | <p>Use evidence from observable patterns to predict future conditions and events. S4.A.3.3.2</p> <p>Differentiate between living and non-living components of the local ecosystem and explain the role of each. S4.B.3.1.1</p> <p>Construct and use models to test predictions. S4.B.3.2.2</p> <p>Explain how everyday human activities depend on the natural environment. S4.B.3.3.1</p> <p>Apply knowledge of uses of land in urban, suburban, and rural communities. S4.B.3.3.4</p> <p>Explain how humans can reduce the effects of pollution. S4.B.3.3.5</p> <p>Examine and record physical properties of matter. S4.C.1.1.1</p> <p>Classify matter based on its physical properties based on student observation using the five senses. S4.C.1.1.2</p> <p>Create models to show how prominent Earth features were formed in Pennsylvania. S4.D.1.1.1**</p> <p>Use models to describe various Earth structures. S4.D.1.1.2</p> <p>Observe and describe physical properties of the components of soil. S4.D.1.1.3</p> <p>Describe and classify Earth materials as renewable, nonrenewable, and reusable. S4.D.1.2.2</p> <p>Describe various human uses of water resources. S4.D.1.2.3</p> <p>Create models and discuss types of freshwater and saltwater bodies. S4.D.1.3.1</p> <p>Model, label, and explain the phases of the water cycle. S4.D.1.3.2</p> | | | |
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| | Model and compare lentic and lotic systems. S4.D.1.3.3 | | | |
| | Describe how land saturation affects water flow and sources. S4.D.1.3.4 | | | |

| COURSE OUTLINE | OBJECTIVES (PA standard) | | | |
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| <p>II. Physical Science</p> <p>I. Forces and Motion</p> <p>A. Force</p> <ol style="list-style-type: none"> 1. Push and Pull 2. Unbalanced forces 3. Friction 4. Air resistance <p>B. Energy</p> <ol style="list-style-type: none"> 1. Potential (stored) energy 2. Kinetic energy 3. Design Concepts <ol style="list-style-type: none"> a. Design processes <ol style="list-style-type: none"> i. design ii. blueprints (technical drawings) iii. requirements iv. aerodynamics b. Build c. Test d. Modify <ol style="list-style-type: none"> i. cost-effectiveness ii. performance e. Explain results <p>II. Scientific Processes</p> <p>A. Design and Conduct Investigation</p> <ol style="list-style-type: none"> 1. Observations 2. Inferences 3. Variables | <p>Record direct observations and use them to draw conclusions to differentiate fact from opinion. S4.A.1.1.1</p> <p>Design, create, and revise models that describe the improvement of technology and their impact. S4.A.1.1.2</p> <p>Recognize factors that affect motion and distance. S4.A.1.3.2</p> <p>Utilize and evaluate various strategies to generate scientific questions. S4.A.2.1.1</p> <p>Create and evaluate the fairness of an investigation that tests one variable. S4.A.2.1.2</p> <p>Evaluate the information and data collected to formulate a conclusion. S4.A.2.1.4</p> <p>Select appropriate tools or instruments for specific tasks based on the information the tool can provide. S4.A.2.2.1</p> <p>Describe what different models represent. S4.A.3.2.1</p> <p>Demonstrate sources and examples of potential and kinetic energy. S4.C.2.1.1</p> <p>Describe and explain the transfer of energy from one source to another. S4.C.2.1.2</p> <p>Design a model to show how force causes changes in motion. S4.C.3.1.1</p> <p>Design experiments that show the movement of objects and describe the type of motion that is evident. S4.C.3.1.2</p> <p>Describe the distance and direction an object travels when acted upon by a force. S4.C.3.1.3</p> | | | |

| COURSE OUTLINE | OBJECTIVES (PA standard) | | | |
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| <p>III. Life Science</p> <p>I. Cycles</p> <p>A. Life cycle</p> <p>1. stages</p> <p>B. Annual cycle</p> <p>1. migration</p> <p>II. Habitat</p> <p>A. Food chain</p> <p>B. Habitat</p> <p>III. Scientific Processes</p> <p>A. Design and Conduct Investigation</p> <p>1. Observations</p> <p>2. Inferences</p> <p>3. Variables</p> | <p>Record direct observations and use them to draw conclusions to differentiate fact from opinion. S4.A.1.1.1</p> <p>Observe and compile daily data that shows change. S4.A.1.3.1</p> <p>Demonstrate and explain physical changes resulting from heat, cold, or light. S4.A.1.3.2</p> <p>Utilize and evaluate various strategies to generate scientific questions. S4.A.2.1.1</p> <p>Create and evaluate the fairness of an investigation that tests one variable. S4.2.1.2</p> <p>Evaluate recorded observations of natural phenomenon to make predictions. S4.A.2.1.3</p> <p>Evaluate the information and data collected to formulate a conclusion. S4.A.2.1.4</p> <p>Describe evidence from investigations and use it to defend conclusions. S4.A.2.1.5</p> <p>Select appropriate tools or instruments for specific tasks based on the information the tool can provide. S4.2.2.1</p> <p>Examine and report a relationship between the living and the non-living components in a system. S4.A.3.1.2</p> <p>Differentiate the parts of an ecosystem as either living or non-living and summarize their roles in the system. S4.A. 3.1.3</p> <p>Describe what different models represent. S4.A.3.2.1</p> <p>Create and explain models to demonstrate how systems work. S4.A. 3.2.2</p> <p>Design and construct models to illustrate a system. S4A.3.2.3</p> <p>Locate, record, and explain observable patterns. S4A.3.3.1</p> <p>Use evidence from observable patterns to predict future</p> | | | |

| COURSE OUTLINE | OBJECTIVES (PA standard) | | | |
|----------------|--|--|--|--|
| | <p>conditions and events. S4.A.3.2.2</p> <p>Indicate and explain life processes. S4.B.1.1</p> <p>Associate similar functions of external characteristics amongst different organisms. S4.B.1.1.2</p> <p>Design a habitat to explain basic needs of living things. S4B.1.13</p> <p>Examine and report how parts of living things work together to provide what an organism needs. S4.B.1.1.4</p> <p>Examine and compare the life cycles of different organisms. S4.B.1.1.5</p> <p>Describe specific characteristics that are necessary based on features of a specific environment. S4.B.2.1</p> <p>Associate physical characteristic of parents with their offspring. S4.B.2.2.1</p> <p>Investigate and record how specific adaptations help living organisms survive S4.B.2.1.2</p> <p>Construct a model, report, and explain interactions between living and non-living. S4.B.3.1.2</p> <p>Investigate and report what happens to a living thing when its habitat is changed. S4.B.3.2.1</p> <p>Construct and use models to test predictions. S4.B.3.2.2</p> <p>Predict, report, and explain how seasons affect living things. S4.B.3.2.3</p> <p>Explain how everyday human activities depend on the natural environment. S4.B.3.3.1</p> <p>Identify and describe the effects of biological pests. S4.B.3.3.3</p> | | | |

| COURSE OUTLINE | OBJECTIVES (PA standard) | | | |
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| | Classify matter based on its physical properties from observations using the five senses. S4.C.1.1.2 Describe the sun as the ultimate source of energy in food chains. S8.C.2.2.1 | | | |

| COURSE OUTLINE | OBJECTIVES (PA standard) | | | |
|--|---|--|--|--|
| <p>IV. Health</p> <p>I. Food and Nutrition</p> <p>A. Nutrition</p> <ol style="list-style-type: none"> 1. Food pyramid 2. Informed consumer choices <ol style="list-style-type: none"> a. labels <p>II. Scientific Processes</p> <p>A. Design and Conduct Investigation</p> <ol style="list-style-type: none"> 1. Observations 2. Inferences 3. Variables | <p>Record direct observations and use them to draw conclusions to differentiate fact from opinion. S4.A.1.1.1</p> <p>Observe and compile daily data that shows change. S4.A.1.3.1</p> <p>Utilize and evaluate various strategies to generate scientific questions. S4.A.2.1.1</p> <p>Create and evaluate the fairness of an investigation that tests one variable. S4.2.1.2</p> <p>Evaluate recorded observations of natural phenomenon to make predictions. S4.A.2.1.3</p> <p>Evaluate the information and data collected to formulate a conclusion. S4.A.2.1.4</p> <p>Describe evidence from investigations and use it to defend conclusions. S4.A.2.1.5</p> <p>Associate parts of the food and fiber system with their source. S4.A.3.1.4</p> <p>Indicate and explain life processes. S4.B.1.1</p> <p>Examine and report how parts of living things work together to provide what an organism needs. S4.B.1.1.4</p> <p>Construct and use models to test predictions. S4.B.3.2.2</p> <p>Classify matter based on its physical properties from observations using the five senses. S4.C.1.1.2</p> <p>Describe and explain the transfer of energy from one source to another. S4.C.2.1.2</p> <p>Describe and examine the use of products and byproducts of plants and animals for human use. S4.D.1.2.1</p> | | | |

| COURSE OUTLINE | OBJECTIVES (PA standard) | | | |
|---|---|--|--|--|
| <p>V. Scientific Processes</p> <p>A. Design and Conduct Investigation</p> <ol style="list-style-type: none"> 1. Observations 2. Inferences 3. Variables | <p>Identify basic cloud types (i.e., cirrus, cumulus, stratus, cumulonimbus) and make connections to basic elements of weather (e.g., changes in temperature, precipitation). S4.D.2.1.1</p> <p>Identify weather patterns from data charts or graphs of the data (e.g., temperature, wind direction, wind speed, cloud types, precipitation). S4.D.2.1.2</p> <p>Identify appropriate instruments (i.e., thermometer, rain gauge, weather vane, anemometer, and barometer) to study weather and what they measure. S4.D.2.1.3</p> | | | |