

Quarterly Environmental Theme: How do living things interact in our community?
4th Grade Essential Question: How do structures impact our communities?

Standards of Learning:

ENVIRONMENT

Standard 1:
Ecological, Social, and Economic Systems
 Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels.

Standard 2:
The Natural and Built Environment
 Students engage in inquiry and systems thinking and use information gained through learning experiences in, about, and for the environment to understand the structure, components, and processes of natural and human-built environments.

Standard 3:
Sustainability and Civic Responsibility
 Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.

Related Environmental Activities:

PLT Activity 22: Trees as Habitats
 Students will describe ways animals and plants depend on trees for survival and, in turn, influence the trees. Students will identify interrelationships between the organisms using a tree.

PLT 42: Sunlight and Shades of Green
 Students will test the effects of lack of sunlight on plant leaves. Students will describe the process of photosynthesis and how it enables a plant to survive.

PLT 45: Web of Life:
 Students will understand that ecosystems are made up of interdependent organisms and other components

PLT 95: Did You Notice
 Students will investigate changes in their local environment over the course of time. Students will summarize those changes in the form of a timeline.

PLT 59 & 60 Power of Print
 Students will analyze some of the ways that ideas are expressed through word choice. Students will understand and demonstrate the differences between objective and subjective writing.

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Standards of Learning:

SCIENCE

Life Processes

- 4.4 The student will investigate and understand basic plant anatomy and life processes. Key concepts include
- a) the structures of typical plants (leaves, stems, roots, and flowers);
 - b) processes and structures involved with reproduction (pollination, stamen, pistil, sepal, embryo, spore, and seed);
 - c) photosynthesis (sunlight, chlorophyll, water, carbon dioxide, oxygen, and sugar); and
 - d) Dormancy.

Living Systems

- 4.5 The student will investigate and understand how plants and animals in an ecosystem interact with one another and the nonliving environment. Key concepts include
- a) behavioral and structural adaptations;
 - b) organization of communities;
 - c) flow of energy through food webs;
 - d) habitats and niches;
 - e) life cycles; and
 - f) Influence of human activity on ecosystems.

Related Environmental Objectives:

- Recognize that plants and animals, including humans, can be classified by the sources of energy and matter (food) they consume.
- Define ecosystems as interacting assemblages of organisms, non-living components that support those organisms and the interactions among them.
- Explain potential consequences when a component of an ecosystem is changed or eliminated (e.g., when components of a food chain or food web are affected by competition for resources or other changes, whether natural or human-caused).
- Describe factors that can adversely affect the health of an ecosystem (e.g., loss of organisms, disruption of food webs).

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Standards of Learning:

SOCIAL STUDIES

Virginia: The Physical Geography and Native Peoples

- VS.2 The student will demonstrate knowledge of the physical geography and native peoples, past and present, of Virginia by
- a) locating Virginia and its bordering states on maps of the United States;
 - b) locating and describing Virginia’s Coastal Plain (Tidewater), Piedmont, Blue Ridge Mountains, Valley and Ridge, and Appalachian Plateau;
 - c) locating and identifying water features important to the early history of Virginia (Atlantic Ocean, Chesapeake Bay, James River, York River, Potomac River, Rappahannock River, and Lake Drummond and the Dismal Swamp);
 - d) locating three American Indian language groups (the Algonquian, the Siouan, and the Iroquoian) on a map of Virginia;
 - e) describing how American Indians related to the climate and their environment to secure food, clothing, and shelter;
 - f) describing how archaeologists have recovered new material evidence at sites including Werowocomoco and Jamestown;
 - g) Identifying and locating the current state-recognized tribes.

Related Environmental Objectives:

- Describe the differences among the various regions of Virginia, providing examples of landforms, bodies of water, vegetation and climate in each.
- Give examples of the variety of ecosystems in Virginia.
- Provide examples of how water, landforms, vegetation and climate affect human activity in Virginia.
- Identify that the needs of humans in Virginia are met by using goods and ecosystem services from natural systems.

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Standards of Learning:

READING

- 4.3 The student will read fiction and nonfiction with fluency and accuracy.
 - a) Use context to clarify meanings of unfamiliar words.
- 4.4 The student will read and demonstrate comprehension of fiction.
 - a) Explain the author’s purpose.
 - b) Describe how the choice of language, setting, and information contributes to the author’s purpose.
 - c) Compare the use of fact and fantasy in historical fiction with other forms of literature.
 - d) Identify major events and supporting details.
 - e) Describe the relationship between text and previously read materials.
 - f) Identify sensory words.

Guided Reading Resources:
(From Fontas and Pinnell Library)

DRA 28 -34
Dancing with the Indians M The Littles Go Exploring M Working at a TV Station M
DRA 36 -40
<i>A Million Fish More or Less O</i> <i>Plant Life O</i> Shark Lady O Where Have All the Pandas Gone P The Drum Beats On P G is for Googol P In the Rain Forest P Food Chain P If You Lived With the Cherokee Q If You Lived With the Indians of the Northwest Q Magic School Bus Food Chain Q
DRA > 40
All About Sharks R Native American Art R Octopus, Squid, and Cuttlefish R Seahorses, Pipefish, and Their Kin S All About Turtles S Wacky Trees T The 10 Deadliest Plants T Lights, Camera, Amalee Brian’s Winter T

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Standards of Learning:

WRITING

- 4.7 The student will write effective narratives, poems, and explanations.
- Focus on one aspect of a topic.
 - Develop a plan for writing.
 - Organize writing to convey a central idea.
 - Write several related paragraphs on the same topic.
 - Utilize elements of style, including word choice and sentence variation.
 - Write rhymed, unrhymed, and patterned poetry.
 - Use available technology.
- 4.8 The student will edit writing for correct grammar, capitalization, spelling, punctuation, and sentence structure.
- Incorporate adjectives and adverbs.
 - Use the articles *a*, *an*, and *the* correctly.

During the first quarter students will complete a unit on narrative writing.

Here are some links to narrative writing units:

[Writing Binder](#)

[Teacher's College Reading and Writing Project](#)

[Gwinnett County GA Writing Units](#)

Related Inquiry Unit Texts:

(from 4th Grade Making Meaning and Being a Writer Libraries)
Waterfall's Gift Ryder, Joanne
I Want to be An Environmentalist Maze, Stephanie
Log's Life Pfeffer, Wendy
Who Eats What? Food Chains and Food Webs Lauber, Patricia
Virginia Geography Boyd, Bentley
Sees Behind Trees Dorris, Michael
Betcha! Murphy, Stuart

Related Environmental Activities:

The students will:

- Write journal entries from the perspective of Native Virginians
- Use content specific vocabulary to describe organisms in Forest Hill Park
- Compare their development as a writer to the development of plants – marking milestones in their writing life
- Make observations in nature and use appropriate articles to describe each

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Standards of Learning:

MATHEMATICS

- 4.1 The student will
- a) identify orally and in writing the place value for each digit in a whole number expressed through millions;
 - b) compare two whole numbers expressed through millions, using symbols ($>$, $<$, or $=$); and
 - c) Round whole numbers expressed through millions to the nearest thousand, ten thousand, and hundred thousand.
- 4.2 The student will
- a) compare and order fractions and mixed numbers;
 - b) represent equivalent fractions; and
 - c) Identify the division statement that represents a fraction.
- 4.3 The student will
- a) read, write, represent, and identify decimals expressed through thousandths;
 - b) round decimals to the nearest whole number, tenth, and hundredth;
 - c) compare and order decimals; and
 - d) Given a model, write the decimal and fraction equivalents.

Related Environmental Activities:

The students will:

- Tally of different organisms in Forest Hill Park (trees, leaves)
- Write number equations based on observations at Forest Hill Park
- Estimate blades of grass, population of organisms etc.
- Write and solve word problems using niche, community, and population

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Standards of Learning:

ART	4.7	The student will describe and use hand-building techniques, including the slab method, to make a ceramic work of art.	<p><u>Related Environmental Objectives:</u></p> <ul style="list-style-type: none"> • Use charts and pictures to provide examples and describe the diverse architectural styles and transportation systems in various California communities and show how they are influenced by local natural systems. • Give examples of the variety of ecosystems in Virginia. • Give examples of the variety of ecosystems in Virginia. • Describe habitat restoration as a process that can sometimes be used to make it possible for plants and animals to survive and reproduce in areas where they once could not. <p style="padding-left: 40px;">Provide examples of how the functioning of structures plants and animals (including humans) have for growth, survival, and reproduction depends on the health of those plants and animals and the health of natural systems.</p> <ul style="list-style-type: none"> • <p><u>Related Environmental Activities:</u></p> <p>The students will:</p> <ul style="list-style-type: none"> • Make visual representations of animal’s physical adaptations found in Forest Hill Park habitat • Make a representation of pottery that may be found by an archeologist • Discuss the connection between environment and the architecture built by native people of Virginia •
	4.8	The student will identify positive and negative space in works of art.	
	4.9	The student will use contour drawing, perspective drawing, and shading techniques to create a work of art that depicts a three-dimensional object on a two-dimensional surface.	
	4.14	The student will identify and describe the influences of ancient cultures on Early American architecture.	

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Standards of Learning:

MUSIC

- 4.14 The student will exhibit respect for the contributions of self and others in a music setting.
1. Contribute to a group effort of making music.
 2. Contribute to a group effort of listening to music.
 3. Participate in music activities that involve sharing, taking turns, and other ways of demonstrating good citizenship.
- 4.7 The student will create music through a variety of experiences.
1. Improvise simple melodic and rhythmic accompaniments.
 2. Create melodic or rhythmic motives to enhance literature, using a variety of sound sources, including technology.

Related Environmental Objectives:

- Understand that many musical forms are inspired by sounds heard in nature
- Observe musical instruments inspired by shapes found in nature (gourds, bamboo)

Related Environmental Activities:

The students will:

- Compose songs about Virginia
- Use instruments to imitate nature sounds to compose music
- Identify the rhythmic patterns in traditional music

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Standards of Learning:

HEALTH & PE

- 4.5 The student will identify opportunities to participate in regular physical activity at school, at home, and in the community.
- 4.4 The student will demonstrate positive interactions with others in cooperative and competitive physical activities.
 - a) Work productively and respectfully with others in achieving a common group goal.
 - b) Work toward positive solutions in resolving disagreements.
 - c) Demonstrate appropriate etiquette and application of rules and procedures.
 - d) Identify the contributions various cultures have made to sport, dance, and recreational pursuits.

Related Environmental Objectives:

- Understand that habitat affects the types of sports and recreational activities people can enjoy
- Describe how the Indian nations met their nutritional needs based on the indigenous plant life in Virginia
- Compare how people use the environment to meet their needs from the past and in the present.

Related Environmental Activities:

The students will:

- Relate the climate and terrain of Virginia to the success of the Native Indians and plan a locally grown meal
- Research games played by the Powhatan such as Lacrosse

INSTRUCTIONAL ELEMENTS

Key Vocabulary	Instructional Strategies	Instructional Materials	Technology
<ul style="list-style-type: none"> • Archeologists • Border • Plateau • Culture • Geography • Climate • Environment • Reproduction • Embryo • Pollination • Evidence • Photosynthesis • Dormancy • Chlorophyll • Community • 	<ul style="list-style-type: none"> • Integrating content into • Language Arts activities • Author/Illustrator studies • Literature Circles • Web-Quest • Experiential learning (project-based) • Direct instruction • Small Group • Reflective discussions • Comparing/contrasting • Peer partner editing • Field Trips <ul style="list-style-type: none"> ○ Science Museum ○ New Kent Forestry Center ○ Channel 12 News Studio 	<ul style="list-style-type: none"> • Websites referenced in VDOE • scope and sequence • Natural materials from Forest • Hill Park • Related texts • Assessment resources • Graphic organizers • Project Learning Tree guide • VA Studies CD • Computers • Video Camera • Maps of VA • Journals • Charts and Graphs • LCD Projector • Crayons, markers, paints • Rulers • White boards and markers • Foldables • Index cards • Self-stick notes • reusable materials 	<ul style="list-style-type: none"> • Webquest • United Streaming • Powerpoint • Wikispaces – to plan/ share information • Blogspot • Audacity – to create podcast • VA Trekkers •

INQUIRY PROJECT & CULMINATING ACTIVITY

Goal:

The 4th grade classes will work together to research the relationship between environment and human culture then plan and execute news broadcast.

Elements:

- a) The students will write scripts based on historical fiction text and present them orally
- b) The students will identify and classify organisms at Forest Hill Park
- c) Develop grammatically correct interview questions and answers
- d) Create a regional map as a visual aid for broadcast
- e) Read historical fiction accounts of Early American life
- f) Use graphic organizers to describe food webs and food chains in Forest Hill Park

Pacing:

This project will be executed in 9 weeks. In class work will be completed during the inquiry block. Component pieces may be executed as home-based projects at the discretion of the classroom teacher.

Evaluation and Assessment:

Component pieces will be evaluated with assignment specific, standards related rubric. Scores for each standard will be entered into Kickboard and averaged as part of the quarterly student mastery grade. An SOL-aligned teacher-created rubric will assess the culminating activity.

SCIENCE

Driving Objectives:	Essential Understanding:	Essential Skills:	Essential Questions:
<p>Scientific Investigation, Reasoning, and Logic</p> <p>4.1 The student will plan and conduct investigations in which</p> <ol style="list-style-type: none"> a) distinctions are made among observations, conclusions, inferences, and predictions; b) hypotheses are formulated based on cause-and-effect relationships; c) variables that must be held constant in an experimental situation are defined; d) appropriate instruments are selected to measure linear distance, volume, mass, and temperature; e) appropriate metric measures are used to collect, record, and report data; f) data are displayed using bar and basic 	<ul style="list-style-type: none"> • The plant kingdom can be divided into two general groups: those that produce seeds and those that produce spores. • Many seed-producing plants have roots, stems, leaves, and flowers. The stamen and pistil are reproductive parts of the flower. The sepals are the small leaves that form the housing of the developing flower. • Pollination is part of the reproductive process of flowering plants. Some plants reproduce with spores. These include ferns and mosses. • Green plants produce their own food through the process of photosynthesis. Green plants use chlorophyll to produce food using carbon dioxide, water, nutrients, and sunlight. • Oxygen is produced during photosynthesis. • Dormancy is a period of suspended life processes brought on by changes in the 	<p>Differentiate among simple observations, conclusions, inferences, and predictions, and correctly apply the Terminology in oral and written work.</p> <p>Make predictions based on picture graphs, bar graphs, and Basic line graphs.</p> <p>Describe various relationships found in habitats</p> <p>Compare the roles of producers, consumers, and decomposers in a food web</p> <p>Compare a food web to a food chain</p> <p>Classify various plants based on their reproductive systems</p> <p>Describe the process of photosynthesis</p>	<p>How do plants reproduce? How do organisms use their habitat to meet their needs? What are the differences between behavioral and physical adaptations? How do organisms use energy from the sun? What are the parts of a plant? What are the basic needs of an organism to ensure survival? How are communities organized? How does the environment impact dormancy and other life cycle?</p>

<p>line graphs; g) numerical data that are contradictory or unusual in experimental results are recognized; and h) predictions are made based on data from picture graphs, bar graphs, and basic line graphs.</p> <p>Living Systems</p> <p>4.5 The student will investigate and understand how plants and animals in an ecosystem interact with one another and the nonliving environment. Key concepts include</p> <ol style="list-style-type: none"> behavioral and structural adaptations; organization of communities; flow of energy through food webs; habitats and niches; life cycles; and Influence of human activity on ecosystems. 	<p>environment.</p> <ul style="list-style-type: none"> Organisms have structural adaptations, or physical attributes that help them meet a life need. The organization of communities is based on the utilization of the energy from the sun within a given ecosystem. The greatest amount of energy in a community is in the producers. Within a community, organisms are dependent on the survival of other organisms. Energy is passed from one organism to another. The organization of a community is defined by the interrelated niches within it. The sun’s energy cycles through ecosystems from producers through consumers and back into the nutrient pool through decomposers. An organism’s habitat provides food, water, shelter, and space. The size of the habitat depends on the organism’s needs. 		
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SOCIAL STUDIES

Driving Objectives:	Essential Understanding:	Essential Skills:	Essential Questions:
<p>VS.1 The student will demonstrate skills for historical and geographical analysis and responsible citizenship, including the ability to</p> <ul style="list-style-type: none"> a) identify and interpret artifacts and primary and secondary source documents to understand events in history; b) determine cause-and-effect relationships; c) compare and contrast historical events; d) draw conclusions and make generalizations; e) make connections between past and present; f) sequence events in Virginia history; g) interpret ideas and events from different historical perspectives; h) evaluate and discuss issues orally and in writing; i) Analyze and interpret 	<p>Locations of places can be described in relative terms. Geographic regions have distinctive characteristics. Virginia can be divided into five geographic regions. Water features were important to the early history of Virginia. Many early Virginia cities developed along the Fall Line, the natural border between the Coastal Plain (Tidewater) and the Piedmont regions, where the land rises sharply and waterfalls prevent further travel on the river. The four major rivers that flow into the Chesapeake Bay are separated by peninsulas. The Chesapeake Bay separates the Eastern Shore from the mainland of Virginia. American Indians were the first people who lived in Virginia. American Indians lived in all areas of the state. There were three major language groups in Virginia. Virginia's American Indians worked with the climate and the environment to meet their basic needs.</p>	<p>Draw conclusions and make generalizations. (VS.1d)</p> <p>Interpret ideas and events from different historical perspectives. (VS.1g)</p> <p>Analyze and interpret maps to explain relationships among landforms, water features, climatic characteristics, and historical events. (VS.1i)</p> <p>Identify and interpret artifacts to understand events in history. (VS.1a)</p> <p>Determine cause-and-effect-relationships. (VS.1b)</p> <p>Compare and contrast historical events. (VS.1c)</p> <p>Draw conclusions and make generalizations. (VS.1d)</p>	<p>What large bodies of water border Virginia? What states border Virginia? What are the five geographic regions of Virginia? How do the geographic regions of Virginia differ? Where are the geographic regions of Virginia located? Which water features were important to the early history of Virginia? How did water features influence the development of Virginia? How did the flow of rivers affect the settlement of Virginia? What is a peninsula? Where is the Eastern Shore located? What evidence is there that American Indians lived in all areas of Virginia? What were the three major language groups found in Virginia, and where was each group located? What are some characteristics of Virginia's</p>

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<p>maps to explain relationships among landforms, water features, climatic characteristics, and historical events.</p> <p>VS.2 The student will demonstrate knowledge of the physical geography and native peoples, past and present, of Virginia by</p> <ul style="list-style-type: none"> a) locating Virginia and its bordering states on maps of the United States; b) locating and describing Virginia’s Coastal Plain (Tidewater), Piedmont, Blue Ridge Mountains, Valley and Ridge, and Appalachian Plateau; c) locating and identifying water features important to the early history of Virginia (Atlantic Ocean, Chesapeake Bay, James River, York River, Potomac River, Rappahannock River, and Lake Drummond and the Dismal Swamp); d) locating three American Indian language groups 	<p>Virginia Indian cultures have changed over time. Archaeology is another way to help people understand the past. Recent archaeological digs have recovered new material evidence about Werowocomoco and historic Jamestown. American Indian people have lived in Virginia for thousands of years. Today, eight American Indian tribes in Virginia are recognized by the Commonwealth of Virginia.</p>		<p>climate? What are some ways Virginia’s American Indians related to the climate and interacted with their environment to meet their basic needs? How do Virginia’s American Indians live today as compared to the way they lived in the past? Why is archaeology important? How can new findings change the understanding of history? What are the names of the current state-recognized tribes?</p>
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<p>(the Algonquian, the Siouan, and the Iroquoian) on a map of Virginia;</p> <p>e) describing how American Indians related to the climate and their environment to secure food, clothing, and shelter;</p> <p>f) describing how archaeologists have recovered new material evidence at sites including Werowocomoco and Jamestown;</p> <p>g) Identifying and locating the current state-recognized tribes.</p> <p>VS.3 The student will demonstrate knowledge of the first permanent English settlement in America by</p> <p>a) explaining the reasons for English colonization;</p> <p>b) describing how geography influenced the decision to settle</p>			
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<p>at Jamestown;</p> <p>c) identifying the importance of the charters of the Virginia Company of London in establishing the Jamestown settlement;</p> <p>d) identifying the importance of the General Assembly (1619) as the first representative legislative body in English America;</p> <p>e) identifying the importance of the arrival of Africans and English women to the Jamestown settlement;</p> <p>f) describing the hardships faced by settlers at Jamestown and the changes that took place to ensure survival;</p> <p>g) Describing the</p>			
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Patrick Henry School of Science and Arts Fourth Grade First Quarter Curriculum Plan

interactions between the English settlers and the native peoples, including the contributions of Powhatan to the survival of the settlers.			
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ENVIRONMENT

Driving Objectives:	Essential Understanding:	Essential Skills:	Essential Questions:
<p>3.2 Understands human interaction with the environment.</p> <p>5.2.1 Creates and uses a research question to conduct research on an issue or event.</p> <p>EALR 1: Analyze a system in terms of subsystems functions as well as input and outputs.</p>	<ul style="list-style-type: none"> ✓ All organisms depend on their environment to meet their basic needs ✓ Humans have always used their environment to meet their needs and wants ✓ There are accepted rules of language that must be employed to communicate effectively ✓ Archeologists and anthropologist communicate their ideas about the past 	<ul style="list-style-type: none"> • Identify relationships found within various habitats • Effectively communicate ideas concerning the environment and other local interest using appropriate terminology. • Describe how people have used their environments to meet their needs and wants • Making observations to support opinions and predications • Reading a variety of maps (population, topical, and political) 	<ul style="list-style-type: none"> ➤ How do people interact with their environment? ➤ How do people learn about the past? ➤ In what ways do humans impact their environment? ➤ What evidence can be used to show what life was like in the past? ➤ How do the geographic regions of Virginia vary?

Resources

Community (Field Trips)	Internet	People and Other Resources
<p>Appomattox State Park –to observe natural habitat in Virginia</p> <p>Belle Isle/ Brown Island – walking trail to see the fall line separating the Tidewater from the Piedmont regions. Also a natural habitat for indigenous plant life</p> <p>Chickahominy Wildlife Management System – provides hiking trips and explains efforts to protect Virginia’s natural habitats and populations</p> <p>WRIC Studios – provides tours of newsroom. Students can prepare for their culminating activity</p>	<p>Powhatan Games and Crafts that can be completed in school or as part of a at home project</p> <p>Virginia Native Plant Society website gives students detailed information about plants that are indigenous to Virginia</p> <p>National Geographic Kids is filled with games and kid friendly information about habitat, and animal adaptations</p> <p>VA Regions webquest takes students on a virtual tour of each of the 5 VA regions.</p>	<p>Victory farms students must identify plant in school’s vegetable garden</p> <p>Students may interview family members for footage for their newscast</p> <p>Invite local radio/television personality</p>