

WOW! The Wonder of Wetlands

Alignment with Maryland State Curriculum Grades K-12¹

Let the Cattail Out of the Bag (pages 78-79)

STUDENTS WILL BECOME AWARE OF SOME OF THE QUALITIES OF WETLANDS BY USING THEIR SENSES TO INTERACT WITH DIFFERENT MATERIALS THAT HAVE QUALITIES SIMILAR TO THOSE IN A WETLAND.

GRADE LEVELS: K-6

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr.K D.2.a. Use words to describe location, size, color, and shape. Gr.K-6 D.3. Understand, acquire, and use new vocabulary.</p> <p>7.0 Speaking Gr. K-3 A.1.a. Speak clearly enough to be heard and understood in a variety of settings.</p>	None	<p>1.0 Skills and Processes Gr. K-2 A. Constructing Knowledge B. Applying Evidence and Reasoning C. Communicating Scientific Information Gr. 3-5 C. Communicating Scientific Information</p> <p>2.0 Earth/Space Gr. K A.1. Investigate objects and materials in the environment Gr.2 A.1. Describe and compare properties of a variety of Earth materials.</p> <p>3.0 Life Science Gr. K A.1.a. Identify and describe features of animals and plants that make some of them alike in the way they look and things they do. A.1.b. Compare descriptions of the features that make some animals and some plants very different from one another. A.1.d Compare ideas about how the features of animals and plants affect what these animals and plants are able to do. D.1.a. Observe, describe, and give examples and describe the many kinds of living things found in familiar places.</p>	None

¹ Activities meet standards as noted. When a standard is listed without notation, the activity meets the standard fully. For example, if it is listed as *Science Grade 2 1.0 Skills and Processes A-C* that means all parts are covered but if it is listed as *Science Grade 2 1.0 Skills and Processes A.1.b. Seek information through reading, observation, exploration, and investigations* then that is the only part of the indicator covered by the activity.

Wetland Metaphors (pages 85-87)

STUDENTS WILL USE COMMON OBJECTS AS PHYSICAL METAPHORS FOR THE FUNCTION OF WETLANDS. THEY WILL BE ABLE TO DESCRIBE THE CHARACTERISTICS OF A WETLAND, APPRECIATE THE IMPORTANCE OF WETLANDS TO WILDLIFE AND HUMANS, AND IDENTIFY THE ECOLOGICAL FUNCTIONS OF WETLANDS.

GRADE LEVELS: 1-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr. 1-8 D.3 Understand, acquire, and use new vocabulary.</p> <p>2.0 Comprehension of Informational Text Gr. 3-8 A.5.a. Identify words and phrases with specific effect meaning (similes, metaphors). [While students are not directly using text, this lesson will help them to understand metaphors as figurative language. To completely cover the indicator an extension including text would be necessary.]</p> <p>4.0 Writing [To meet this indicator, students would need to write their metaphors and use them in a description of the wetland.] Gr. 3-4 A.2.b. Describe in prose and/or poetry by using sensory details and vivid language with active verbs and colorful adjectives. Gr. 4-8 A.2.b. Describe in prose and/or poetic forms to clarify, extend, or elaborate on ideas by using vivid language such as imagery and figurative language. Gr. 1-3 A.5 Use effective details, words, and figurative language in the student's own composing. Gr. 4-5 A.5 Assess the effectiveness of choice of details, word choice, and use of figurative language in the students' own composing. Gr. 9-12 1.2.2 The student will determine how the speaker, organization, sentence structure, word choice, tone, rhythm, and imagery reveal an author's purpose.</p>	<p>3.0 Geography Gr. 2 B.1.b. Describe and classify regions using climate, vegetation, animal life, and natural/physical features.</p>	<p>1.0 Skills and Processes Gr. 1-2 A. Constructing Knowledge B. Applying Evidence and Reasoning C. Communicating Scientific Information Gr. 3-5 C. Communicating Scientific Information Gr. 1-8 D. Technology 1-3</p> <p>3.0 Life Science Gr. 5 A.1.a. Identify and describe features and behaviors of some of the plants and animals in a familiar environment and explain ways that these organisms are well suited to their environment.</p> <p>Gr. 9-12 Earth/Space Science 2.3.2 The student will explain how global conditions are affected when natural and human-induced change alters the transfer of energy and matter.</p> <p>Biology 3.5.2 The student will analyze the interrelationships and interdependencies among different organisms and explain how these relationships contribute to the stability of the ecosystem 3.5.3 The student will investigate how natural and man-made changes in environmental conditions will affect individual organisms and the dynamics of populations.</p> <p>Environmental 6.1.1 The student will demonstrate that matter cycles through and between living systems and the physical environment constantly being recombined in different ways. 6.2.1 The student will explain how organisms are linked by the transfer and transformation of matter and energy at the ecosystem level.</p>	<p>None</p>

6.2.2 The student will explain why interrelationships & interdependencies of organisms contribute to the dynamics of ecosystems.

Wetland Habitats (pages 87-92)

STUDENTS WILL SORT OUT AND CLASSIFY DIFFERENT TYPES OF WETLANDS BASED ON THEIR CHARACTERISTICS.

GRADE LEVELS: 6-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr. 6-8 E.4.b. Identify and explain information directly stated in the text. Gr. 6 E.4.c. Identify and explain what is not directly stated in the text by drawing inferences. Gr.7-8 E.4.c. Draw inferences and/or conclusions and make generalizations.</p> <p>2.0 Comprehension of Informational Text Gr. 6-8 A.1. Develop and apply comprehension skills by reading a variety of self-selected and assigned print and non-print informational texts including electronic media. Gr. 6-8 A.2.b. Use or analyze graphic aids that contribute to meaning.</p> <p>Gr. 9-12 Reading, Reviewing, and Responding to Text 1.1.3 The student will use after-reading strategies appropriate to both the text and purpose for reading by summarizing, comparing, contrasting, synthesizing, drawing conclusions, and validating the purpose for reading.</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. 6-8 C.1.b. Interpret tables and graph produced by others and describe in words the relationships they show. Gr. 9-12 1.4.2 The student will analyze data to make predictions, decisions, or draw conclusions. 1.5.8 The student will describe similarities and differences when explaining concepts or principles.</p> <p>3.0 Life Science Gr.6 D.1. In any particular environment, the growth and survival of organisms and species depends on the physical conditions.</p> <p>6.0 Environmental Gr.6 A.1. Recognize and compare how different parts of the world have varying types of natural resources and how the use of those resources impacts environmental quality. [This lesson only covers the first part of the indicator, which is identifying and comparing different types of wetlands. The lesson would need to be extended to discuss how they impact environmental quality.]</p> <p>Gr. 9-12 Environmental 6.2.2 The student will explain why interrelationships & interdependencies of organisms contribute to the dynamics of ecosystems.</p>	<p>None</p>

Wetland Weirdos (pages 94-98)

STUDENTS WILL COLLECT INFORMATION ABOUT CATTAILS AND BEAVERS BY READING AND OBSERVATION, IN ORDER TO RECOGNIZE PLANT AND ANIMALS ADAPTATIONS. IN THE WRAP UP AND ACTION SECTION STUDENTS WILL DRAW OR WRITE ABOUT THEIR OWN IMAGINARY ORGANISM AND DISCUSS ITS SPECIFIC ADAPTATIONS.

GRADE LEVELS: 4-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr. 4-8 D.1.a. Develop and apply vocabulary through exposure to a variety of texts. E.4. Use strategies to demonstrate understanding of the text.</p> <p>2.0 Comprehension of Informational Texts Gr.4-8 A.4.c. State and support main ideas and messages. Gr.4-5 A.4.g. Draw conclusions and inferences and make generalization and predictions from text. Gr.6-8 A.4.g. Synthesize ideas from text</p> <p>4.0 Writing Gr. 4-8 A.2.a. Compose to express personal ideas to develop fluency using a variety of forms such as journals, narratives, letters, reports, and paragraphs.</p> <p>Gr. 9-12 1.1.3 The student will use after-reading strategies appropriate to both the text and purpose for reading by summarizing, comparing, contrasting, synthesizing, drawing conclusions, and validating the purpose for reading. 2.1.3 The student will compose to express personal ideas, using prose and/or poetic forms.</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. 4-8 A. Constructing Knowledge B. Applying Evidence and Reasoning C. Communicating Scientific Information Gr. 9-12 1.2 The student will pose scientific questions and suggest investigative approaches to provide answers to questions.</p> <p>3.0 Life Science Gr.4 E.1. Recognize food as the source of materials that all living things need to grow and survive. Gr.4 F.1. Explain ways that individuals and groups of organisms interact with each other and their environment. Gr.5 & 7 A. Diversity of Life Gr.8 D.1.b. Recognize that adaptations may include variations in structures, behaviors, or physiology.</p> <p>Gr. 9-12 Biology 3.2.1 The student will explain processes and the function of related structures found in unicellular and multicellular organisms. 3.5.2 The student will analyze the interrelationships and interdependencies among different organisms and explain how these relationships contribute to the stability of the ecosystem.</p>	<p>None</p>

Wet 'n' Wild (pages 99-103)

STUDENTS WILL COLLECT AND OBSERVE WETLAND ANIMALS IN ORDER TO CREATE A FIELD GUIDE. STUDENTS WILL DESCRIBE THE LIVING AND NON-LIVING COMPONENTS OF WETLAND HABITATS. STUDENTS WILL CLEARLY UNDERSTAND THE CONCEPT OF HABITAT.

GRADE LEVELS: K-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>4.0 Writing Gr. K A.2.d. Dictate, draw, or write to inform. Gr. 3-7 A.2.e. Use writing-to-learn strategies.</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. K-5 A. Constructing Knowledge B. Applying Evidence and Reasoning C. Communicating Scientific Information K-2 D.1.a. Make something out of paper, cardboard, wood...that can actually be used to perform a task. [Meets standard if students help create collection tools for this activity.] Gr. 6-8 A.1. Design, analyze, or carry out simple investigations and formulate appropriate conclusions based on data obtained or provided.</p> <p>3.0 Life Science Gr. K A.1. Observe a variety of familiar animals and plants to discover patterns of similarity or differences among them. D.1. Recognize that living things are found almost everywhere in the world and that there are different kinds of living things in different places. [Teacher would need to extend this activity to compare wetland habitat findings to other places.] E.1. Develop an awareness of the relationship of feature of living things and their ability to satisfy basic needs that support their growth and survival. F.1. Investigate a variety of familiar places where plant and animals live to describe the place and the living things found there. Gr. 1 A. Diversity of Life Gr. 2 F.1.b. Explain that organisms live in habitats that provide their basic needs. Gr. 3 B.1. Explore the world of minute living things to describe what they look like, how they live, and how they interact with their environment. Gr. 4 F.1.a. Identify and describe the interactions of organisms present in a habitat.</p> <p>Gr. 9-12 Skills and Processes 1.5.5 The student will create and/or interpret graphics. (Scale drawings, photographs, digital images, field of view, etc.) 1.5.8 The student will describe similarities and differences when explaining concepts or principles.</p> <p>Biology 3.5.1 Students will analyze the relationships among organisms and between organisms and abiotic factors. 3.5.2 The student will analyze the interrelationships and interdependencies among different</p>	<p>None</p>

organisms and explain how these relationships contribute to the stability of the ecosystem.

Environmental

6.2 The student will investigate the interdependence of organisms within their biotic environment.

Marsh Market (pages 109-111)

STUDENTS WILL WORK TOGETHER TO CREATE A MODEL OF A MARSH FOOD WEB AND DISCUSS THE VARIOUS ROLES AND INTERRELATIONSHIPS WITHIN THIS WEB. HUMAN INTERACTION WILL BE DISCUSSED AS WELL AS VARIOUS SCENARIOS WHERE HUMAN ACTION IMPACTS THE MARSH. STUDENTS WILL ALSO COMPLETE AN ACTIVITY DIAGRAMMING THEIR LUNCH AND THE ROLE (PRODUCER, CONSUMER, DECOMPOSER) THAT DIFFERENT FOODS PLAY. AS AN EXTENSION, STUDENTS CAN TAKE A FIELD TRIP AND IDENTIFY FOOD WEBS IN THEIR NEIGHBORHOOD AND DISCUSS THE HUMAN ROLE.

GRADE LEVELS: 2-8

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>4.0 Writing Gr. 3-8 A.2.e. Use writing-to-learn strategies (diagrams).</p>	<p>3.0 Geography Gr. 2-8 D. Modifying and Adapting to the Environment [This indicator is only met if the extension is conducted in-depth.]</p>	<p>1.0 Skills and Processes Gr. 2 B.1.b. Develop reasonable explanations for observations made, investigations completed, and information gained by sharing ideas and listening to others' ideas. Gr. 3-5 B.1.b. Offer reasons for their findings and consider reasons suggested by others. Gr. 3-5 C.1.d. Construct and share reasonable explanations for questions asked. Gr.6-8 C.1.a. Organize and present data in tables and graph and identify relationships they reveal. Gr. 6-8 A.1. Design, analyze, or carry out simple investigations and formulate appropriate conclusions based on data obtained or provided.</p> <p>3.0 Life Science Gr. 4-5 & 7 E. Flow of Matter and Energy Gr.4& 6 F. Ecology</p> <p>6.0 Environmental Gr. 2,6,7 A. Natural Resources and Human Needs Gr. 5 A.1.b. Describe how humans use renewable natural resources such as plants, soil, water, and animals. Gr. 2,4-8 B. Environmental Issues [if extension is completed]</p>	<p>None</p>

Marsh Mystery (pages 116-119)

STUDENTS WILL READ A MYSTERY STORY AND IN SOLVING THE MYSTERY COMPLETE AN ACTIVITY ILLUSTRATING THE CONCEPT OF BIOACCUMULATION. STUDENTS WILL RESEARCH AN ISSUE IN THEIR GEOGRAPHIC AREA TO FIND POTENTIAL SOURCE OF POLLUTION AND BIOACCUMULATION AND DETERMINE POSSIBLE SOLUTIONS.

GRADE LEVELS: 5-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr. 5-8 D.1.a. Develop and apply vocabulary through exposure to a variety of texts. E.4. Use strategies to demonstrate understanding of the text.</p> <p>2.0 Comprehension of Informational Texts Gr.5-8 A.4.c. State and support main ideas and messages. Gr.5 A.4.g. Draw conclusions and inferences and make generalization and predictions from text. Gr. 6-8 A.4.g. Synthesize ideas from text.</p> <p>4.0 Writing Gr. 5-7 A.2.e. Use writing-to-learn strategies (diagrams)</p> <p>Gr. 9-12 1.1.3 The student will use after-reading strategies appropriate to both the text and purpose for reading by summarizing, comparing, contrasting, synthesizing, drawing conclusions, and validating the purpose for reading. 2.1.3 The student will compose to express personal ideas, using prose and/or poetic forms.</p>	<p>3.0 Geography Gr. 6 D.1.a Describe ways people modified their environment to meet their needs, such as cultivating lands, building roads, dams, and aqueducts. Gr. 7-8 D.1.c. Identify and explain land use issues that illustrate the conflict between economic growth, deforestation, mining, and burning fossil fuels.</p> <p>Gr. 9-12 3.0 Geography 1.a. Compare climate, land use, natural resources, population distribution, demographic and density maps of Maryland and the United States.</p> <p>4.0 Economics 4.1.3 The student will examine regulatory agencies and their social, economic, and political impact on the country, a region, or on/within a state</p>	<p>3.0 Life Science Gr. 6 D.1.e. Describe ways in which changes in environmental condition can affect the survival of individual organisms and entire species. Gr. 5 E.1.c. Provide examples that justify the statement “Most animals’ food can be traced back to plants.” Gr. 7 E.1.a. Cite evidence from research and observations that food provides molecules that serve as fuel and building materials for all organisms. Gr. 6 F.1.b. Identify and describe factors that could limit populations within any environment...</p> <p>Gr. 9-12 Biology 3.5.1 Students will analyze the relationships between biotic diversity and abiotic factors in environments and the resulting influence on ecosystems. 3.5.3 The student will investigate how natural and man-made changes in environmental conditions will affect individual organisms and the dynamics of populations.</p> <p>Environmental Science 6.3 The student will analyze the relationships between humans and the earth’s resources.</p>	<p>None</p>

This Plant Key is All Wet (pages 123-128)

STUDENTS WILL USE A FLOW CHART OR DICHOTOMOUS KEY TO CLASSIFY PLANTS AND OTHER OBJECTS.

GRADE LEVELS: 3-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>2.0 Comprehension of Informational Text Gr. 3-8 A.1.b. Read, use, and identify characteristics of functional documents such as a set of directions...</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. 3-5 C.1.a. Make use of and analyze models, such as tables and graphs to summarize and interpret data. C.1.d. Construct and share reasonable explanations for questions asked. Gr.6-8 C.1.b. Interpret tables and graphs produced by others and describe in words the relationships they show.</p> <p>3.0 Life Science Gr. 4 A.1.b. Classify a variety of animals and plants according to their observable features and provide reasons for placing them into different groups. A.1.d. Describe what classifying tells us about the relatedness among the animals or plants placed within any group. Gr. 7 A.1.a. Provide examples and explain that organisms sorted into groups share similarities in external structures as well as similarities in internal anatomical structures and processes, which can be used to infer the degree of relatedness among organisms.</p> <p>4.0 Chemistry Gr. 3 A.1.a. Classify objects based on their observable properties.</p> <p>Gr. 9-12 Skills and Processes 1.5.7 The student will use, explain, and/or construct various classification systems. 1.5.8 The student will describe similarities and differences when explaining concepts or principles.</p>	<p>None</p>

Wetland Wheel (pages 129-137)

STUDENTS CONSTRUCT A WETLAND WHEEL AND CLASSIFY SELECTED WETLAND PLANTS TO RECOGNIZE PLANTS INDIGENOUS TO WETLANDS.

GRADE LEVELS: 4-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>2.0 Comprehension of Informational Text Gr. 4-8 A.1.b. Read, use, and identify characteristics of functional documents such as a set of directions... A.2.a-d. Identify and use text features to facilitate understanding of informational texts.</p>	None	<p>1.0 Skills and Processes Gr. 4-5 C.1.a. Make use of and analyze models, such as tables and graphs to summarize and interpret data. C.1.d. Construct and share reasonable explanations for questions asked. Gr. 6-8 C.1.b. Interpret tables and graph produced by others and describe in words the relationships they show.</p> <p>3.0 Life Science Gr. 4 A.1.b. Classify a variety of animals and plants according to their observable features and provide reasons for placing them into different groups. A.1.d. Describe what classifying tells us about the relatedness among the animals or plants placed within any group. Gr. 7 A.1.a. Provide examples and explain that organisms sorted into groups share similarities in external structures as well as similarities in internal anatomical structures and processes which can be used to infer the degree of relatedness among organisms.</p> <p>4.0 Chemistry Gr. 3 A.1.a. Classify objects based on their observable properties.</p> <p>Gr. 9-12 Skills and Processes 1.5.7 The student will use, explain, and/or construct various classification systems. 1.5.8 The student will describe similarities and differences when explaining concepts or principles.</p> <p>Biology 3.5.1 Students will analyze the relationships between biotic diversity and abiotic factors in environments and the resulting influence on ecosystems.</p>	None

Tracking Plants and Keeping Track (pages 138-142)

STUDENT WILL COLLECT, ORGANIZE, AND DISPLAY PLANTS IN A HERBARIUM NOTEBOOK. THE FOCUS OF THIS LESSON IS ON COLLECTING, ORGANIZING, AND KEEPING INFORMATION.

GRADE LEVELS: 5-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>2.0 Comprehension of Informational Text Gr. 5-8 A.1.b. Read, use, and identify characteristics of functional documents such as a set of directions... A.2.a-d. Identify and use text features to facilitate understanding of informational text. [These indicators apply if students refer back to and use the dichotomous key from This Plant Key is All Wet and Wetland Wheels.</p> <p>4.0 Writing Gr.5 A.1.b. Select and use appropriate organizational structures such as narrative, chronological or sequential order, description... Gr. 5-7 A.2.e. Use writing-to-learn strategies</p> <p>Gr.9-12 1.1.3 The student will use after-reading strategies appropriate to both the text and purpose for reading by summarizing, comparing, contrasting, synthesizing, drawing conclusions, and validating the purpose for reading. 2.1.3 The student will compose to express personal ideas, using prose and/or poetic forms.</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. 5 A.1. Gather and question data from many different forms of scientific investigation include...collecting specimens for analysis. Gr. 6-8 C.1.a. Organize and present data in tables and graph and identify relationships they reveal.</p> <p>3.0 Life Science Gr. 7 A.1.a. Provide examples and explain that organisms sorted into groups share similarities in external structures as well as similarities in internal anatomical structures and processes which can be used to infer the degree of relatedness among organisms.</p> <p>Gr. 9-12 Skills and Processes 1.5.4 The student will create and/or interpret graphics 1.5.7 The student will use, explain, and/or construct various classification systems. 1.5.8 The student will describe similarities and differences when explaining concepts or principles.</p>	<p>None</p>

Wetland Address (pages 147-151)

STUDENT WILL IDENTIFY PLANTS AND ANIMALS IN THEIR WETLAND HABITATS BY ANALYZING CLUES THAT DESCRIBE THEIR ADAPTIONS, CHARACTERISTICS, AND OTHER SPECIES TRIVIA. THEY WILL EXPLAIN HOW ADAPTATION ENABLES PLANTS AND ANIMALS TO LIVE IN DIVERSE ENVIRONMENTS.

GRADE LEVELS: 5-10

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>2.0 Comprehension of Informational Text Gr. 5-8 A.4.j. Connect the text to prior knowledge or experience.</p> <p>4.0 Writing Gr. 5-8 A.2.a. Compose to express personal ideas to develop fluency using a variety of forms such as journals, narratives, letters, reports, and paragraph. [Indicator met only if extension is completed.]</p> <p>Gr. 9-10 1.1.3 The student will use after-reading strategies appropriate to both the text and purpose for reading by summarizing, comparing, contrasting, synthesizing, drawing conclusions, and validating the purpose for reading. 2.1.3 The student will compose to express personal ideas, using prose and/or poetic forms. [Indicator met only if extension is completed.]</p>	<p>None</p>	<p>1.0 Skills and Processes Gr.5 B.1.a. Develop explanations using knowledge possessed and evidence from observations, reliable print resources and investigations. Gr. 6-8 B.1.d. Describe the reasoning that lead to the interpretation of data and conclusions drawn.</p> <p>3.0 Life Science Gr. 5 & 7 A. Diversity of Life Gr.6 D.1.e. Describe ways in which changes in environmental conditions can affect the survival of individual organisms and entire species. Gr. 8 D.1.b. Recognize that adaptations may include variations in structures, behaviors, or physiology.</p> <p>Gr. 9-10 Biology 3.5.1 Students will analyze the relationships between biotic diversity and abiotic factors in environments and the resulting influence on ecosystems. 3.5.2 The student will analyze the interrelationships and interdependencies among different organisms and explain how these relationships contribute to the stability of the ecosystem.</p> <p>Environmental 6.2 The student will investigate the interdependence of organisms within their biotic environment.</p>	

Life in the Fast Lane (pages 152-156)

STUDENTS WILL RECORD OBSERVATIONS OF PHYSICAL AND BIOLOGICAL ELEMENTS OF A TEMPORARY WETLAND OVER TIME. THEY WILL DESCRIBE THE BENEFITS AND CHALLENGES OF LIFE IN A TEMPORARY WETLAND.

GRADE LEVELS: 3-8

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>4.0 Writing Gr.3-8 A.2.c. Compose to inform using a structure with a clear beginning, middle, and end and selection of major points, examples, and facts to support a main idea.</p>	<p>3.0 Geography Gr. 4 B.1.a. Compare physical characteristics of different places and regions of Maryland and the United States including natural/physical features, weather and climate, soil, vegetation, minerals and animal life. D.1.b. Describe ways and reasons people in Maryland and the United States modify the natural environment and the consequences of modifications. D.1.c. Explain how the growth of communities and suburbs have had consequences on the environment, loss of farmland, and pollution. Gr. 7-8 D.1.c. Identify and explain land use issues that illustrate the conflict between economic growth, deforestation, mining, and burning fossil fuels.</p>	<p>1.0 Skills and Processes Gr. 3-8 A. Constructing Knowledge B. Applying Evidence and Reasoning C. Communicating Scientific Information</p> <p>3.0 Life Science Gr. 3 B.1. Explore the world of minute living things to describe what they look like, how they live, and how they interact with their environment Gr. 4 F.1.a. Identify and describe the interactions of organisms present in a habitat. Gr. 5 A.1.a. Identify and describe features and behaviors of some of the plants and animals in a familiar environment and explain ways that these organisms are well suited to their environment. A.1.b. Based on information about the features and behaviors of animals and plants from very different environments describe reasons that they might not survive if their environment changed or if they were moved from one environment to another. Gr. 6 D.1.b. Explain that in all environments organisms with similar needs may compete with one another for resources. D.1.e. Describe ways in which changes in environmental conditions can affect the survival of individual organisms and entire species. F.1. Give reasons supporting the fact that the number of organisms an environment can support depends on the physical conditions and resources available. Gr. 8 D.1. Recognize and describe that evolutionary change in species over time occurs as a result of natural variation in organisms and environmental change.</p> <p>3.0 Environmental Gr. 4-8 B. Environmental Issues [Discussion and Extension may be directed to cover these indicators]</p>	<p>2.0 Geometry Gr. 5-6 A.1.c. Identify and describe the radius and diameter of a circle. [Students do diameter in this activity.]</p> <p>3.0 Measurement Gr. 4-6 B.1.a. Select and use appropriate tools and units.</p>

A Drop in the Bucket (pages 158-161)

STUDENTS WILL PARTICIPATE IN A DEMONSTRATION THAT SHOWS THE LIMITED SUPPLY OF FRESH WATER ON THE EARTH. STUDENTS WILL ESTIMATE AND CALCULATE THE PERCENT OF AVAILABE FRESH WATER.

GRADE LEVELS: 6-8

[Although this lesson is designed for Grades 6-8, the book includes a modification for K-2 students so those indicators are listed below]

Reading/English/ Language Arts	Social Studies	Science	Mathematics
None	<p>3.0 Geography Gr. 1-2 D.1.b. Describe why and how people protect the environment. D.1.c. Explain how people adapt to changes in the environment. Gr. 7-8 D.1.b. Evaluate the consequences of modifying the natural environment. D.1.c. Identify and explain land use issues that illustrate the conflict between economic growth, deforestation, mining, and burning fossil fuels.</p>	<p>1.0 Skills and Processes Gr. K-2 A.1.b. Seek information through reading, observation, exploration, and investigations. Gr. 6-8 C.1.e. Explain how different models can be used to represent the same thing. D.1.b. Explain, using examples, that models are often used to think about processes that happen too slowly...to observe directly or are too vast to be changed deliberately.</p> <p>2.0 Earth Science Gr.1 E.1. Describe observable changes in water on the surface of the Earth. Gr. 2 E.1. Recognize and describe that the surface of Earth is more than half covered with water. Gr. 8 E.1.b. Recognize and describe the water cycle as the distribution and circulation of Earth’s water through the glaciers, surface water, groundwater, oceans, and atmosphere.</p> <p>6.0 Environmental Gr. 2 A.1. a-e (except c) Recognize and explain how Earth’s natural resources from the natural environment are used to meet human needs. B.1. Recognize and describe that the activities of individuals or groups of individuals can affect the environment. Gr. 6 A.1. Recognize and compare how different parts of the world have varying amounts and types of natural resources and how the use of those resources impacts environmental quality. Gr. 6-8 B. Environmental Issues [Extension discussion may be directed to cover these indicators]</p>	<p>4.0 Statistics Gr. 7 A.1.b. Organize and display data to make circle graphs.</p> <p>6.0 Number Relationships and Computation Gr. 2 A.1.c. Develop a sense of the size of a number in relation to other numbers Gr. 6 C.1.c. Multiply decimals C.1.d. Divide decimals C.1.e. Determine a percent of a whole number Gr. 6-7 C.2.a. Determine approximate products and quotients of decimals. Gr. 6-8 C.3. Analyze ratios, proportions, or percents</p>

Salt Marsh Players (pages 165-173)

STUDENTS WILL ACT OUT A PLAY TO DEMONSTRATE HOW VARIOUS SALT MARSH PLANTS AND ANIMALS ADAPT TO LIVING IN A SALT MARSH. STUDENTS WILL BE ABLE TO IDENTIFY VARIOUS PLANTS AND ANIMALS. THEY WILL CREATE CHARACTER SKETCHES TO SHOW HOW VARIOUS PLANTS AND ANIMALS ADAPT.

GRADE LEVELS: 3-6

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr. 3-6 D.1.a. Develop and apply vocabulary through exposure to a variety of texts. E.4. Use strategies to demonstrate understanding of the text.</p> <p>2.0 Comprehension of Informational Text Gr. 3-6 A.4.c. State and support main ideas and messages. Gr. 4-5 A.4.g. Draw conclusions and inferences and make generalization and predictions from text. Gr. 6 A.4.g. Synthesize ideas from text.</p> <p>4.0 Writing Gr. 3-6 2.a. Compose to express personal ideas to develop fluency using a variety of forms such as journals, narratives, letters, reports, and paragraph.</p> <p>7.0 Speaking Gr. 3-5 A.2. a-e (except b) Make oral presentations.</p>	<p>None</p>	<p>3.0 Life Science Gr. 5 A.1.a-c. Explain the idea that in any particular environment, some kinds of plants and animals survive well, some less well, and some cannot survive at all. Gr. 3 B.1.c. Provide reasons that support the conclusion that these organisms are alive. Gr. 4 D.1.a. Describe ways in which organisms in one habitat differ from those in another habitat and consider how these differences help them survive and reproduce. F.1. Explain ways that individuals and groups of organisms interact with each other and their environment. Gr.6 D.1.b. Explain that in all environments-freshwater, marine, forest, desert, grassland, mountain, and others-organisms with similar needs may compete with one another for resources, including food, space, water, air, and shelter. D.1c. Explain that in any particular environment individual organisms with certain traits are more likely than others to survive and have offspring. F.1.c. Explain that within any environment organisms with similar needs may compete with one another for resources.</p>	<p>None</p>

Nutrients: Nutrition or Nuisance? (pages 188-191)

STUDENTS WILL PARTICIPATE IN VARIETY OF GAMES THAT SHOW THE BENEFITS AND DANGERS OF EXCESS NUTRIENTS. STUDENT WILL HAVE DIFFERENT ROLES ACTING AS PLANTS OR ANIMALS AFFECTED BY NUTRIENTS.

GRADE LEVELS: K-8 [see guide for specific age of each part of the activity]

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr. K-8 D.3. Understand, acquire, and use new vocabulary.</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. K-2 A.1.b. Seek information through reading, observation, exploration, and investigations. Gr. 6-8 C.1.e. Explain how different models can be used to represent the same thing. D.1.b. Explain, using examples, that models are often used to think about processes that happen too slowly...to observe directly or are too vast to be changed deliberately.</p> <p>3.0 Life Science Gr. K E.1. Develop an awareness of the relationship of features of living thing and their ability to satisfy basic needs that support their growth and survival. Gr. 1 E.1. Describe some of the ways in which animals depend on plants and on each other. Gr. 2 F.1.c. Explain that animals and plants sometimes cause changes in their environments. Gr. 3 E.1. Recognize that materials continue to exist even though they change from one form to another. Gr. 4 E.1. Recognize food as the source of materials that all living things need to grow and survive. F.1. Explain ways that individuals and groups of organisms interact with each other and their environment. Gr. 5 A.1.a. Identify and describe features and behaviors of some of the plants and animals in a familiar environment and explain ways that these organisms are well suited to their environment. A.1.b. Based on information about the features and behaviors of animals and plants from very different environments describe reasons that they might not survive if their environment changed or if they were moved from one environment to another. E.1. Recognize that some source of energy is needed for all organisms to grow and survive. Gr. 6 D.1.b. Explain that in all environments organisms with similar needs may compete with one another for resources. D.1.e. Describe ways in which changes in environmental conditions can affect the survival of individual organisms and entire species. F.1. Give reasons supporting the fact that the number of organisms an environment can support depends on the physical conditions and resources available. Gr. 7 E.1. Explain that the transfer and transformation of matter and energy links organisms to one another and to their physical setting. Gr.8 D.1.b. Recognize that adaptations may include variations in structures, behaviors, or physiology</p> <p>Standard 6.0 Environmental K-8 B. Environmental Issues [All of the indicators for this can be met at the various grade level depending on how much time and how in depth the teacher wants to go with the discussion and assessment]</p>	<p>None</p>

Marsh Munchies (pages 192-198)

STUDENTS WILL PARTICIPATE IN GAME TO LEARN ABOUT RESOURCE LIMITATION AND COOPERATIVE CONSERVATION. STUDENTS WILL TAKE ON THE ROLE OF A MUSKRAT AND GATHER DIFFERENT "CHIPS" THAT REPRESENT FOOD AND ANALYZE THEIR COLLECTION WITH THEIR NEEDS. THEY WILL APPLY MATH SKILLS TO DETERMINE IF THEY HAVE A SHORTAGE OR SURPLUS. FINALLY, THEY WILL WRITE A STORY DESCRIBING THE ACTIVITY

GRADE LEVELS: 5-8

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr. 5-8 D.1.a. Develop and apply vocabulary through exposure to a variety of texts. E.4. Use strategies to demonstrate understanding of the text.</p> <p>2.0 Comprehension of Informational Texts Gr. 5-8 A.4.c. State and support main ideas and messages. Gr. 5 A.4.g. Draw conclusions and inferences and make generalization and predictions from text. Gr. 6-8 A.4.g. Synthesize ideas from text.</p> <p>4.0 Writing Gr.5-8 A.2.c. Compose to inform using a structure with a clear beginning, middle, and end and selection of major points, examples, and facts to support a main idea.</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. 6-8 C.1.e. Explain how different models can be used to represent the same thing. D.1.b. Explain, using examples, that models are often used to think about processes that happen too slowly...to observe directly or are too vast to be changed deliberately.</p> <p>3.0 Life Science Gr. 5 A.1.a. Identify and describe features and behaviors of some of the plants and animals in a familiar environment and explain ways that these organisms are well suited to their environment. A.1.b. Based on information about the features and behaviors of animals and plants from very different environments describe reasons that they might not survive if their environment changed or if they were moved from one environment to another. E.1. Recognize that some source of energy is needed for all organisms to grow and survive. Gr. 6 D.1.b. Explain that in all environments organisms with similar needs may compete with one another for resources. D.1.e. Describe ways in which changes in environmental conditions can affect the survival of individual organisms and entire species. F.1. Give reasons supporting the fact that the number of organisms an environment can support depends on the physical conditions and resources available. Gr. 7 E.1. Explain that the transfer and transformation of matter and energy links organisms to one another and to their physical setting. Gr.8 D.1.b. Recognize that adaptations may include variations in structures, behaviors, or physiology.</p> <p>6.0 Environmental 5-8 B. Environmental Issues [All of the indicators for this can be met depending on how much time and how the depth of the discussion and assessment.]</p>	<p>6.0 Number relationships and computation/arithmetic Gr. 5 C.1.a. Multiply whole numbers. C.1.b. Divide whole numbers. Gr. 7-8 C.1.a. Add, subtract, multiply and divide integers.</p>

Runoff Race (pages 210-211)

STUDENTS WILL PARTICIPATE IN A HANDS-ON DEMONSTRATION THAT SHOWS HOW WETLANDS IMPROVE WATER QUALITY BY FILTERING OUT SEDIMENTS. THEY WILL EXPERIMENT WITH DIFFERENT SCENARIOS AND HOW SEDIMENT AFFECTS WATER QUALITY.

GRADE LEVELS: 2-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>4.0 Writing Gr. 2 A.1.c. Organize related ideas in a simple paragraph Gr.3-8 A.2.c. Compose to inform...</p> <p>4.0 Writing Gr. 9-12 2.1.3 The student will compose to express personal ideas, using prose and/or poetic forms.</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. 2 A.1.b. Seek information through reading, observation, exploration, and investigations. B.1.b. Develop reasonable explanations for observations made, investigations completed and information gained by sharing ideas and listening to others ideas. D.3.a. Explain that a model of something is different from the real thing but can be used to learn something about the real thing. Gr.3-5 B.1.a. Develop explanations using knowledge possessed and evidence from observations, reliable print resources and investigations. C.1.a. Make use of and analyze models... Gr. 6-8 B.1.d. Describe the reasoning that lead to the interpretation of data and conclusions drawn. C.1.e. Explain how different models can be used to represent the same thing. D.1.b. Explain, using examples, that models are often used to think about processes that happen too slowly...to observe directly or are too vast to be changed deliberately.</p> <p>2.0 Earth/Space Science Gr. 2 A.1.b. Collect soil from different locations and compare the properties of the samples [indicator met if students collect the soil for the activity]. Gr. 4 A.2. Recognize and explain how physical weathering and erosion cause changes to the Earth’s surface. Gr. 5 A.2. Cite and describe the processes that cause rapid or slow changes in the Earth’s surface A.3.c. Describe ways that the following processes contribute to changes always occurring to the Earth’s surface: weathering, erosion, deposition. Gr. 6 A.2.a. Identify examples of physical weathering and describe the changes caused in each. [Only part of these indicators are met as only water as a change agent is discussed in this activity] Gr. 9-12 2.3.2 The student will explain how global conditions are affected when natural and human-induced change alter the transfer of energy and matter.</p> <p>3.0 Life Science Gr. 5 A.1.b. Based on information about the features and behaviors of animals and plants from very different environments describe reasons that they might not survive if their environment changed or if they were moved from one environment to another. A.1.e. Explain that the survival of individual organisms and entire populations can be affected by sudden or slow changes in environment. Gr. 6 D.1.e. Describe ways in which changes in environmental conditions can affect the survival of individual organisms and entire species. Gr. 7 E.1. Explain that the transfer and transformation of matter and energy links organisms to one another and to their physical setting. Gr.8 D.1.a. Recognize and describe that gradual and sudden changes in environmental conditions</p>	<p>None</p>

affect the survival of organisms and populations.

6.0 Environmental

Gr. 6 A.1. Recognize and compare how different parts of the world have varying amounts and types of natural resources and how the use of those resources impacts environmental quality.

Gr. 7 A.1.a. Based on data identify and describe the positive and negative impacts of an increasing human population on the use of natural resources.

K-8 B. Environmental Issues [All of the indicators for this can be met at the various grade level depending on how much time and how in depth the teacher wants to go with the discussion and assessment.]

Gr. 9-12 6.3.2 The student will evaluate the interrelationship between humans and water quality and quantity.

6.3.3 The student will evaluate the interrelationship between humans and land resources.

Wetland in a Pan (pages 212-213)

STUDENTS WILL CREATE A MODEL TO SHOW HOW WETLANDS BUFFER FROM FLOODS AND FILTER WATER. STUDENTS WILL DISCUSS THE EFFECT MUDDY WATER HAS ON ANIMALS, PLANTS, AND HUMANS.

GRADE LEVELS: 3-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
None	<p>3.0 Geography Gr. 3 D.1. Explain how people modify, protect, and adapt to their environment. Gr. 4 D.1.b-d Describe how people adapt to, modify and impact the natural environment. Gr. 6 D.1.a. Describe ways people modified their environment to meet their needs, such as cultivating lands, building roads, dams, and aqueducts. Gr. 7 D.1. Analyze why and how people in contemporary world regions modify their natural environment and the impact of those modifications. Gr. 8 D.1. Analyze why and how people in the United States modify their natural environment and the impact of those modifications.</p>	<p>1.0 Skills and Processes Gr. 2 A.1.b. Seek information through reading, observation, exploration, and investigations. B.1.b. Develop reasonable explanations for observations made, investigations completed and information gained by sharing ideas and listening to others ideas. D.3.a. Explain that a model of something is different from the real thing but can be used to learn something about the real thing. Gr.3-5 B.1.a. Develop explanations using knowledge possessed and evidence from observations, reliable print resources and investigations. C.1.a. Make use of and analyze models... Gr. 6-8 B.1.d. Describe the reasoning that lead to the interpretation of data and conclusions drawn. C.1.e. Explain how different models can be used to represent the same thing. D.1.b. Explain, using examples, that models are often used to think about processes that happen too slowly...to observe directly or are too vast to be changed deliberately.</p> <p>2.0 Earth/Space Science Gr. 2 A.1.b. Collect soil from different locations and compare the properties of the samples [indicator met if students collect the soil for the activity] Gr.4 A.2. Recognize and explain how physical weathering and erosion cause changes to the Earth’s surface. Gr. 5 A.2. Cite and describe the processes that cause rapid or slow changes in the Earth’s surface. A.3.c. Describe ways that the following processes contribute to changes always occurring to the Earth’s surface: weathering, erosion, deposition. Gr. 6 A.2.a. Identify examples of physical weathering and describe the changes caused in each. [Only part of these indicators are met as only water as a change agent is discussed in this activity] Gr. 9-12 2.3.2 The student will explain how global conditions are affected when natural and human-induced change alter the transfer of energy and matter.</p> <p>3.0Life Science Gr. 4 F.1. Explain ways that individuals and groups of organisms interact with each other and their environment. Gr. 5 A.1.b. Based on information about the features and behaviors of animals</p>	None

and plants from very different environments describe reasons that they might not survive if their environment changed or if they were moved from one environment to another.

A.1.e. Explain that the survival of individual organisms and entire populations can be affected by sudden or slow changes in environment.

Gr. 6 D.1.e. Describe ways in which changes in environmental conditions can affect the survival of individual organisms and entire species.

F.1.b. Identify and describe factors that could limit populations within any environment...

Gr. 7 E.1. Explain that the transfer and transformation of matter and energy links organisms to one another and to their physical setting.

Gr. 8 D.1.a. Recognize and describe that gradual and sudden changes in environmental conditions affect the survival of organisms and populations.

Biology

9-12 3.5.1 The student will analyze the relationships between biotic diversity and abiotic factors in environments and the resulting influence on ecosystems.

3.5.4 The student will illustrate how all organisms are part of and depend on two major global food webs that are positively or negatively influenced by human activity and technology.

6.0 Environmental

Gr. 6 A.1. Recognize and compare how different parts of the world have varying amounts and types of natural resources and how the use of those resources impacts environmental quality.

Gr. 7 A.1.a. Based on data identify and describe the positive and negative impacts of an increasing human population on the use of natural resources.

K-8 B. Environmental Issues [All of the indicators for this can be met at the various grade level depending on how much time and how in depth the teacher wants to go with the discussion and assessment.]

Gr.9-12 6.3.2 The student will evaluate the interrelationship between humans and water quality and quantity.

6.3.3 The student will evaluate the interrelationship between humans and land resources.

Nature's Recyclers (pages 226-230)

STUDENTS WILL INVESTIGATE A DECOMPOSING LOG OR LEAF LITTER AND SOIL. THEY BE ABLE TO IDENTIFY THE ANIMALS THAT HELP WITH DECOMPOSITION AND EXPLAIN THEIR ROLE IN SOIL DECOMPOSITION.

GR.ADE LEVELS: K-6

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>2.01.0 Writing Gr. K A.2.d. Dictate, draw, or write to inform. Gr. 1 A.2.d. Use details that support a topic with a clear beginning, middle, and end to inform. Gr. 2 A.2.d. Compose to inform using major points and examples to support a main idea. Gr. 3-6 A.2.e. Use writing-to-learn strategies (diagrams)</p> <p>4.0 Writing Gr. 2 A.1.c. Organize related ideas in a simple paragraph Gr.3-6 A.2.c. Compose to inform using a structure with a clear beginning, middle, and end and selection of major points, examples, and facts to support a main idea.</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. K-2 A.1. Raise questions about the world around them and be willing to seek answers to some of them by making careful observations and trying things out. B.1.b. Develop reasonable explanations for observations made, investigations completed, and information gained by sharing ideas and listening to others' ideas Gr. 3-5 A.1.b. Select and use appropriate tools...to augment observations of objects, events, and processes. A.1.e. Follow directions carefully and keep accurate records of one's work in order to compare data B.1.b. Offer reasons for their findings and consider reasons suggested by others. C.1.d. Construct and share reasonable explanations for questions asked. Gr. 6 A.1. Design, analyze, or carry out simple investigations and formulate appropriate conclusions based on data obtained or provided.</p> <p>2.0 Earth Science Gr. K A.1. Investigate objects and materials in the environment.</p> <p>3.0 Life Science Gr. K E.1. Develop an awareness of the relationship of features of living things and their ability to satisfy basic needs that support their growth and survival. F.1. Investigate a variety of familiar places where plants and animals live to describe the place and the living things found there. Gr.1 B.1.a. Use magnifying instruments to observe parts of living things...to describe parts seen with the magnifier. E.1. Describe some of the ways in which animals depend on plants and each other. Gr. 2 F.1. Explain that organisms can grow and survive in many different habitats [the log is an example of one habitat in this activity] Gr. 3 B.1. Explore the world of minute living things to describe what they look like, how they live, and how they interact with their environment. E1. Recognize that materials continue to exist even though they change from one form to another. Gr. 4 E.1.c. Identify the things that are essential for plants to grow and survive. F.1 Explain ways that individuals and groups of organisms interact with each</p>	<p>6.0 Knowledge of Number Relationships and Computation/Arithmetic Gr. K A.1.a. Apply knowledge of whole numbers and place value A.1.b. Construct relationships between quantities using language such as: more than, less... Gr. 1-2 A.1.a. Use concrete materials to compose and decompose quantities</p>

other and their environment.

Gr. 5 A.1.a. Identify and describe features and behaviors of some of the plants and animals in a familiar environment and explain ways that these organisms are well suited to their environment.

E.1. Recognize that some source of energy is needed for all organisms to grow and survive.

Do You Dig Wetland Soil? (pages 231-238)

STUDENTS WILL MAKE A WETLANDS SOILS COLOR CHART AND DIG A HOLE TO IDENTIFY THE PHYSICAL CHARACTERISTICS OF THE SOIL. STUDENTS WILL USE KEYS TO RECOGNIZE THE SOIL AND WILL COMPARE UPLAND AND WETLAND SOILS. STUDENTS WILL RECORD THEIR OBSERVATIONS AND IDENTIFY ENVIRONMENTAL AND HUMAN FACTORS THAT AFFECT SOIL CONDITIONS.

GRADE LEVELS: K-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr. K-8 D.3. Understand, acquire, and use new vocabulary. Gr. 6-8 E.4.b. Identify and explain information directly stated in the text. Gr. 6 E.4.c. Identify and explain what is not directly stated in the text by drawing inferences. Gr. 7-8 E.4.c. Draw inferences and/or conclusions and make generalizations.</p> <p>2.0 Comprehension of Informational Text Gr. 6-8 A.1. Develop and apply comprehension skills by reading a variety of self-selected and assigned print and non-print informational texts including electronic media. Gr. 6-8 A.2.b. Use or analyze graphic aids that contribute to meaning.</p> <p>Gr.9-12 Reading, Reviewing, and Responding to Text 1.1.3 The student will use after-reading strategies appropriate to both the text and purpose for reading by summarizing, comparing, contrasting, synthesizing, drawing conclusions, and validating the purpose for reading.</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. K-2 A.1. Raise questions about the world around them and be willing to seek answers to some of them by making careful observations and trying things out. B.1.b. Develop reasonable explanations for observations made, investigations completed, and information gained by sharing ideas and listening to others' ideas. C.1. Ask, "How do you know?" in appropriate situations and attempt reasonable answers when others ask them the same question. [If guest speaker comes in for extension then C.1.e. is met] Gr. 3-5 A.1.e. Follow directions carefully and keep accurate records of one's work in order to compare data. B.1.a. Develop explanations using knowledge possessed and evidence from observations, reliable print resources and investigations. B.1.b. Offer reasons for their findings and consider reasons suggested by others. C.1.a. Make use of and analyze models, such as tables and graph to summarize and interpret data. C.1.d. Construct and share reasonable explanations for questions asked. C.1.e. Recognize that doing science involves many different kinds of work and engages men and women of all ages and backgrounds. [If guest speaker comes in for extension] Gr. 6-8 B.1.d. Describe the reasoning that lead to the interpretation of data and conclusions drawn. C.1.a. Organize and present data in tables and graph and identify the relationships they reveal. C.1.b. Interpret tables and graph produced by others and describe in words the relationships they show. Gr. 9-12 1.4.2 The student will analyze data to make predictions, decisions, or draw conclusions. 1.5.8 The student will describe similarities and differences when explaining concepts or principles.</p> <p>2.0 Earth/Space Science Gr. K A.1. Investigate objects and materials in the environment. Gr. 2 A.1.b. Collect soil from different locations and compare the properties of the samples. A.1.c. Use examples of observations...to describe ways Earth materials can change</p>	<p>None</p>

E.1.a. Identify the many locations where water is found.

Gr. 4 A.2.b. Cite evidence to show that erosion shapes and reshapes the earth's surface as it moves from one location to another.

Gr.5 A.3.c. Describe ways that the following processes contribute to changes always occurring to the Earth's surface: weathering, erosion, and deposition.

Gr. 6 A.2. Cite evidence to demonstrate and explain that physical weathering and chemical weathering can cause changes to Earth materials.

Gr. 9-12 2.3.2 The student will explain how global conditions are affected when natural and human-induced changes alter the transfer of energy and matter.

4.0 Chemistry

Gr. K A.1. Compare the observable properties of a variety of objects and the materials they are made of using evidence from investigations.

Gr. 2 B.1. Provide evidence from investigations that things can be done to materials to change some of their properties.

D.1. Provide evidence from investigations to identify processes that can change physical properties of materials.

Gr. 3 A.1. Identify ways to classify objects using supporting evidence from investigations of observable properties.

Gr. 4 A.1.b. Describe and compare the physical properties of samples of matter.

Gr. 8 D.3.a. Investigate and describe the occurrence of chemical reactions...

Gr. 9-12 4.5.1 The student will describe the general types of chemical reactions.

6.0 Environmental

Gr. K-8 B. Environmental Issues [Discussion and Extension may be directed to cover these indicators]

Grades 9-12 6.3.3 The student will evaluate the interrelationship between humans and land resources.

How Thirsty is the Ground? (pages 239-244)

STUDENTS WILL PREDICT AND TEST PERMEABILITY OF DIFFERENT TYPES OF SOILS IN ORDER TO COMPARE THEM. STUDENTS WILL ANALYZE THIS INFORMATION TO DETERMINE HOW SOME WETLANDS ARE CREATED.

GRADE LEVELS: 3-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr. 3-8 D.3. Understand, acquire, and use new vocabulary. Gr. 7-8 E.4.c. Draw inferences and/or conclusions and make generalizations.</p> <p>2.0 Comprehension of Informational Text Gr. 3-8 A.1.b. Read, use, and identify characteristics of functional documents such as a set of directions... Gr. 6-8 A.2.b. Use or analyze graphic aids that contribute to meaning.</p>	<p>None</p>	<p>1.0 Skills and Processes Gr. 3-8 A. Constructing Knowledge B. Applying Evidence and Reasoning C. Communicating Scientific Information Gr. 9-12 1.2 The student will pose scientific questions and suggest investigative approaches to provide answers to questions (all indicators for this expectation). 1.3 The student will carry out scientific investigations effectively and employ the instruments, systems of measurement, and materials of science appropriately. (All indicators for this expectation.) 1.4 The student will demonstrate that data analysis is a vital aspect of the process of scientific inquiry and communication. (All indicators under this expectation except 1.4.8) 1.5.8 The student will describe similarities and differences when explaining concepts or principles. 1.6.1 The student will use ratio and proportion in appropriate situations to solve problems.</p> <p>2.0 Earth/Space Science Gr. 3 E.1. Recognize and describe that water can be found as a liquid or a solid on the Earth’s surface and as a gas in the Earth’s atmosphere. Gr. 4 A.2. Recognize and explain how physical weathering and erosion cause changes to the earth’s surface. Gr. 5 A.2. Cite and describe the processes that cause rapid or slow changes in Earth’s surface. A.3.c. Describe ways that the following processes contribute to changes always occurring to the Earth’s surface: weathering, erosion, and deposition. Gr. 6 A.2. Cite evidence to demonstrate and explain that physical weathering and chemical weathering can cause changes to Earth materials. Gr. 9-12 2.3.2 The student will explain how global conditions are affected when natural and human-induced changes alter the transfer of energy and matter.</p>	<p>3.0 Measurement Gr. 4-6 B.1.a. Select and use appropriate tools and units. Gr. 4 C.1.c. Determine start time, elapsed time, and end time. C.2.b. Determine equivalents units of time. Gr. 5 C.2. Calculate equivalent measurements. Gr. 8 C.1.c. Estimate and determine the volume of a cylinder [extension activity].</p> <p>3.0 Statistics Gr. 3-5 A.1.a. Collect data by conducting surveys Gr. 3 A.1.d. Organize and display data to make single bar graph using a variety of categories and intervals.</p> <p>5.0 Number Relationships and Computation Gr. 3 C.1. Analyze number relationships and compute Gr. 4 C.1. a-c Analyze number relationships and compute Gr. 5 C.1.a. Multiply whole numbers C.1.b. Divide whole numbers Gr. 6 C.1.c. Multiply decimals C.1.d. Divide decimals C.1.e. Determine a percent of a whole number Gr. 6-7 C.2.a. Determine approximate products and quotients of decimals. Gr. 6-8 C.3. Analyze ratios,</p>

4.0 Chemistry

Gr. 3 A.1. Identify ways to classify objects using supporting evidence from investigations of observable properties.

Gr. 4 A.1.b. Describe and compare the physical properties of samples of matter.

Environmental

Gr. 9-12 6.1.1 The student will demonstrate that matter cycles through and between living systems and the physical environment constantly being recombined in different ways.

6.3.3 The student will evaluate the interrelationship between humans and land resources.

proportions, or percents.

Algebra/Data Analysis

Gr. 9-12 3.1.1 The student will design and/or conduct an investigation that uses statistical methods to analyze data and communicate results.

Nature's Filter (pages 250-251)

STUDENTS WILL TEST THE FILTER ABILITY OF DIFFERENT TYPES OF SOIL AND IDENTIFY WHICH SOILS RETAIN POLLUTANTS BEST BY WORKING WITH SOIL SAMPLES.
STUDENTS WILL LEARN WHY WETLANDS ARE GOOD FOR POLLUTION CONTROL.

GRADE LEVELS: K- 3 (as demo) 4-12 (team or individual project)

Reading/English/ Language Arts	Social Studies	Science	Mathematics
None	<p>3.0 Geography Gr. 1-3 D.1. a-b Explain how people modify, protect, and adapt to their environment. Gr. 4 D.1.b-d Describe how people adapt to, modify and impact the natural environment. Gr. 6 D.1.a. Describe ways people modified their environment to meet their needs, such as cultivating lands, building roads, dams, and aqueducts. Gr. 7 D.1. Analyze why and how people in contemporary world regions modify their natural environment and the impact of those modifications. Gr.8 D.1. a-c Analyze why and how people in the United States modify their natural environment and the impact of those modifications.</p>	<p>1.0 Skills and Processes Gr. K-2 A.1.b. Seek information through reading, observation, exploration, and investigations. B.1.b. Develop reasonable explanations for observations made, investigations completed and information gained by sharing ideas and listening to others ideas. C. Communicating Scientific Information D.3.a. Explain that a model of something is different from the real thing but can be used to learn something about the real thing. Gr.3-5 B.1.a. Develop explanations using knowledge possessed and evidence from observations, reliable print resources and investigations. C.1.a. Make use of and analyze models... Gr. 6-8 B.1.d. Describe the reasoning that lead to the interpretation of data and conclusions drawn. C.1.e. Explain how different models can be used to represent the same thing. D.1.b. Explain, using examples, that models are often used to think about processes that happen too slowly...to observe directly or are too vast to be changed deliberately. Gr. 9-12 1.3 The student will carry out scientific investigations effectively and employ the instruments, systems of measurement, and materials of science appropriately. 1.4.2 The student will analyze data to make predictions, decisions, or draw conclusions. 1.5.8 The student will describe similarities and differences when explaining concepts or principles.</p> <p>2.0 Earth/Space Science Gr. K A.1.a. Observe and describe a variety of natural human-made objects found in familiar environments. A.1.b. Examine and describe Earth materials. Gr. 2 A.1.b. Collect soil from different locations and compare the properties of the samples. [Indicator met if students collect the soil for the activity.] Gr. 4 A.2. Recognize and explain how physical weathering and erosion cause changes to the Earth's surface. Gr. 5 A.2. Cite and describe the processes that cause rapid or slow changes in the Earth's surface. A.3.c. Describe ways that the following processes contribute to changes always</p>	None

occurring to the Earth's surface: weathering, erosion, deposition.

Gr. 6 A.2.a. Identify examples of physical weathering and describe the changes caused in each. [Only part of these indicators are met, as only water as a change agent is discussed in this activity.]

Gr. 9-12 2.3.2 The student will explain how global conditions are affected when natural and human-induced change alter the transfer of energy and matter.

Biology

9-12 3.5.1 The student will analyze the relationships between biotic diversity and abiotic factors in environments and the resulting influence on ecosystems.

3.5.4 The student will illustrate how all organisms are part of and depend on two major global food webs that are positively or negatively influenced by human activity and technology.

6.0 Environmental

Gr.6 A.1. Recognize and compare how different parts of the world have varying amounts and types of natural resources and how the use of those resources impacts environmental quality.

Gr. 7 A.1.a. Based on data identify and describe the positive and negative impacts of an increasing human population on the use of natural resources.

K-8 B. Environmental Issues [All of the indicators for this can be met at the various grade level depending on how much time and how in depth the teacher wants to go with the discussion and assessment]

Gr.9-12 6.3.2 The student will evaluate the interrelationship between humans and water quality and quantity.

6.3.3 The student will evaluate the interrelationship between humans and land resources.

Regulation Rummy (pages 270-277)

STUDENTS WILL PLAY A CARD GAME DESIGNED TO SHOW THEM THE COMPLEXITY OF WETLAND REGULATIONS AND HELP CREATE AN UNDERSTANDING FOR WHY WETLANDS REGULATIONS AND MANAGEMENT EXISTS. STUDENTS WILL LEARN ABOUT VARIOUS LEGISLATIVE ACTS PERTAINING TO WETLANDS AND APPLY THIS KNOWLEDGE IN THE GAME.

GRADE LEVELS: 9-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>Gr.9-12 Reading, Reviewing, and Responding to Text</p> <p>1.1.2 The student will use during-reading strategies appropriate to both the text and purpose for reading by visualizing, making connections, and using fix-up strategies such as re-reading, questioning, and summarizing.</p> <p>1.1.3 The student will use after-reading strategies appropriate to both the text and purpose for reading by summarizing, comparing, contrasting, synthesizing, drawing conclusions, and validating the purpose for reading.</p>	<p>Gr. 9-12 Political Science</p> <p>1.1.3. The student will evaluate roles and policies the government has assumed regarding public issues.</p> <p>1.2.3 The student will evaluate the impact of governmental decisions and actions that have affected the rights of individuals and groups in American society and/or have affected maintaining order and/or safety.</p> <p>U.S. History</p> <p>5.5.3 Evaluate the impact of government politics and domestic policy on American society from 1968 to 1980.</p> <p>5.5.6 Students will demonstrate understanding of the cultural, economic, political and social developments from 1981 to the present.</p>	<p>Gr. 9-12 Earth/Space Science</p> <p>2.3.2 The student will explain how global conditions are affected when natural and human-induced change alter the transfer of energy and matter.</p> <p>Biology</p> <p>3.5.1 The student will analyze the relationships between biotic diversity and abiotic factors in environments and the resulting influence on ecosystems.</p> <p>3.5.4 The student will illustrate how all organisms are part of and depend on two major global food webs that are positively or negatively influenced by human activity and technology.</p> <p>Environmental</p> <p>6.3.2 The student will evaluate the interrelationship between humans and water quality and quantity.</p> <p>6.3.3 The student will evaluate the interrelationship between humans and land resources.</p>	<p>None</p>

What a Boat! (pages 278-279)

STUDENTS WILL USE RUSHES, CATTAILS, OR REEDS TO DESIGN AND BUILD A BOAT. THIS WILL EXPAND THEIR APPRECIATION OF WETLAND MATERIALS AND THE ROLE WETLANDS PLAYED IN SUPPORTING INDIGENOUS PEOPLE.

GRADE LEVELS: 1-5

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>4.0 Writing [These indicators are met if extension is completed]</p> <p>Gr.1 A.2.d. Use details that support a topic with a clear beginning, middle, and end to inform.</p> <p>Gr. 2 A.1.c. Organize related ideas in a simple paragraph.</p> <p>Gr.3-5 A.2.c. Compose to inform using a structure with a clear beginning, middle, and end and selection of major points, examples, and facts to support a main idea.</p>	<p>2.0 Peoples of the Nation and World</p> <p>Gr. 4 A.1.c. Examine and describe the unique and diverse cultures of early native American societies.</p>	<p>1.0 Skills and Processes</p> <p>Gr. 1-5 A. Constructing Knowledge B. Applying Evidence and Reasoning C. Communicating Scientific Information</p> <p>1-2 D.1.a. Make something out of paper, cardboard, wood...that can actually be used to perform a task. [If students help create collection tools for this activity.]</p> <p>D.1.d. Recognize that some kinds of materials are better than others for making any particular thing...</p> <p>D.3. Examine a variety of physical models and describe what they teach about the real things they are meant to resemble.</p> <p>Gr. 3-5 D.1.b. Realize that there is no perfect design and that usually some features have to be sacrificed to get others...</p> <p>D.3. Examine and modify models and discuss their limitations.</p> <p>3.0 Life Science</p> <p>Gr. 2 F.1.b. Explain that organisms live in habitats that provide their basic needs.</p> <p>Gr. 4 F.1.a. Identify and describe the interactions of organisms present in a habitat.</p> <p>6.0 Environmental</p> <p>Gr. 2 A.1. Recognize and explain how Earth's natural resources from the natural environment are used to meet human needs.</p> <p>Gr. 5 A.1.b. Describe how humans use renewable natural resources.</p>	<p>None</p>

Chrysti the Wordsmith on Wetlands (pages 280-284)

STUDENTS WILL PLAY A WORD GAME AND RESEARCH THE ETYMOLOGY OF WETLAND NAMES. THEY WILL USE A VARIETY OF RESEARCH TOOLS TO DETERMINE THE WORD DERIVATION.

GRADE LEVELS: 7-12

Reading/English/ Language Arts	Social Studies	Science	Mathematics
<p>1.0 General Reading Processes Gr. 7-8 D.2. Apply conceptual understanding of new words. D.2. Understand, acquire, and use new vocabulary. Gr. 9-12 2.3.1 The student will identify sources of information on a self-selected and/or given topic and assess their appropriateness to accomplish a purpose. 2.3.2 The student will use various information retrieval sources (traditional and electronic) to obtain information on a self-selected and/or given topic. Electronic sources include automated catalogs, CD ROM products, and on-line services like Internet, World Wide Web, and others. 2.3.5 The student will synthesize information from two or more sources to fulfill a self-selected or given purpose.</p>	<p>3.0 Geography Gr. 7 B.1. a. Identify and describe physical characteristics that influenced human settlement.</p> <p>6.0 Skills and Processes Gr. 7-8 A.1. Use appropriate strategies and opportunities to increase understandings of social studies vocabulary</p>	<p>None</p>	<p>None</p>