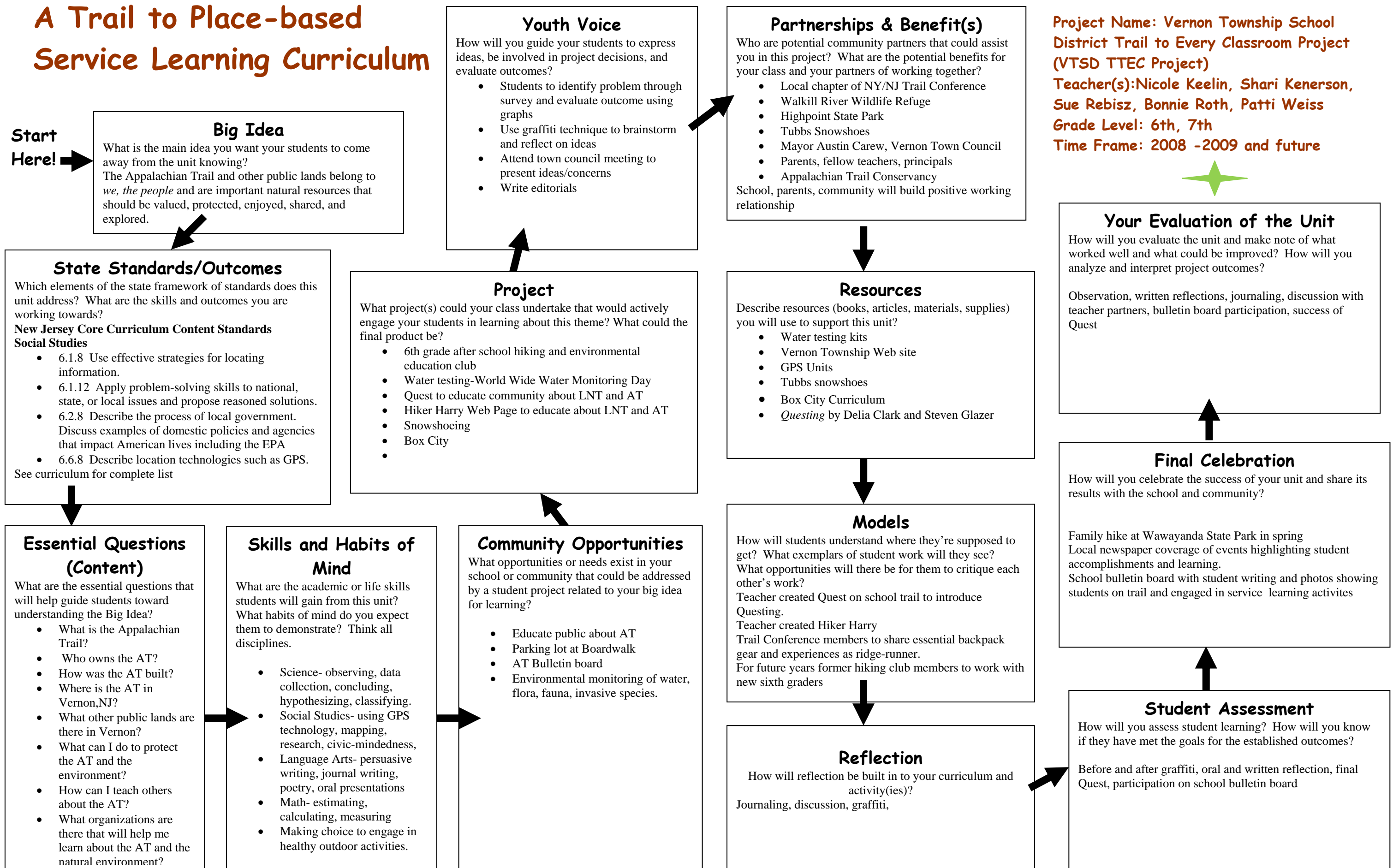


A Trail to Place-based Service Learning Curriculum



**Vernon Trail To Every Classroom
Curriculum Guide**

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Background

The **Vernon Trail To Every Classroom** project involves the efforts and ideas of five teachers in Vernon, New Jersey who participated in a graduate program entitled, "A Trail To Every Classroom" (TTEC) during the spring, summer, and fall of 2008. The course was offered by the Appalachian Trail Conservancy and the National Park Service with graduate credits through Lebanon Valley College in Pennsylvania. The course combined the teaching theories of Place-Based Learning and Service Learning. It emphasized hands-on, place based learning experiences for students, a multi-content area approach, incorporation of Core Curriculum Content Area Standards, and the development of partnerships between schools, parents, students, and the community.

Introduction

The **Vernon Trail To Every Classroom** project will engage students in cross-curricular learning experiences that will lead to an appreciation and understanding of their own community as they relate their experiences to the larger world. Students will actively participate in learning experiences that will lead to an understanding of the interplay between the natural environment of Vernon, New Jersey and the affect the activities of people have on their environment. Students will have opportunities to learn about the various components that make up a community starting from themselves and the role they can play to interact with the natural world, their community leaders, and the local, state, and national organizations that oversee public and private lands. We will engage community partners such as the Wallkill River Wildlife Refuge, Wawayanda State Park, High Point State Park, the New York/New Jersey Trail Conference, and the Vernon Township Town Council to provide students with place-based opportunities for learning. In addition, the **Vernon Trail To Every Classroom** project seeks to engage students in service-learning projects that will instill a life-long commitment to their own opportunities for participatory experiences to make their world and ours a better place.

The curriculum is designed for grades six to eight at two middle schools, Glen Meadow Middle School and Lounsberry Hollow Middle School. At the sixth grade level at Lounsberry Hollow Middle School, forty-five students have formed an after school hiking and environmental education club for the 2008-2009 school year under the direction of three sixth grade teachers. At Glen Meadow Middle School, seventh and eighth grade students under the direction of two teachers are engaged in place-based service learning activities. In addition, seventh and eighth grade students will join the hiking club for after school activities several times throughout the school year. During the 2009-2010 school year graduates from the sixth grade hiking club will move up to seventh grade and will be encouraged to be student ambassadors for the newly formed 2009-2010 LHMS Hiking Club.

Additionally, the Vernon Trail To Every Classroom Project addresses the problem of childhood obesity by bringing kids outdoors for healthy physical activity such as hiking and snowshoeing in the hopes to foster a life-long pursuit of physical activity.

Big Idea

The Appalachian Trail and other public lands belong to *we, the people* and are important natural resources that should be explored, enjoyed, valued, shared, and protected.

New Jersey Core Curriculum Content Standards

Science

STANDARD 5.1 (Scientific Processes) All students will develop problem-solving, decision-making and inquiry skills, reflected by formulating usable questions and hypotheses, planning experiments, conducting systematic observations, interpreting and analyzing data, drawing conclusions, and communicating results.

STANDARD 5.4 (Nature and Process of Technology) All students will understand the interrelationships between science and technology and develop a conceptual understanding of the nature and process of technology.

STANDARD 5.5 (Characteristics of Life) All students will gain an understanding of the structure, characteristics, and basic needs of organisms and will investigate the diversity of life.

STANDARD 5.6 (Chemistry) All students will gain an understanding of the structure and behavior of matter.

STANDARD 5.7 (Physics) All students will gain an understanding of natural laws as they apply to motion, forces, and energy transformations.

STANDARD 5.10 (Environmental Studies) All students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.

Language Arts

STANDARD 3.2 (Writing) All students will write in clear, concise, organized language that varies in content and form for different audiences and purposes.

STANDARD 3.3 (Speaking) All students will speak in clear, concise, organized language that varies in content and form for different audiences and purposes.

STANDARD 3.4 (Listening) All students will listen actively to information from a variety of sources in a variety of situations.

STANDARD 3.5 (Viewing and media literacy) All students will access, view, evaluate, and respond to print, nonprint, and electronic texts and resources.

Math

STANDARD 4.2 (Geometry and measurement) All students will develop spatial sense and the ability to use geometric properties, relationships, and measurement to model, describe and analyze phenomena.

STANDARD 4.5 (Mathematical processes) All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

Social Studies

STANDARD 6.2 (Civics) All students will know, understand and appreciate the values and principles of American democracy and the rights, responsibilities, and roles of a citizen in the nation and the world.

STANDARD 6.6 (Geography) All students will apply knowledge of spatial relationships and other geographic skills to understand human behavior in relation to the physical and cultural environment.

Visual and Performing Arts

STANDARD 1.1 (Aesthetics) All students will use aesthetic knowledge in the creation of and in response to dance, music, theater, and visual art.

STANDARD 1.2 (Creation and Performance) All students will utilize those skills, media, methods, and technologies appropriate to each art form in the creation, performance, and presentation of dance, music, theater, and visual art.

Technological Literacy

STANDARD 8.1 (Computer and information literacy) All students will use computer applications to gather and organize information and to solve problems.

STANDARD 8.2 (Technology Education) All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world as they relate to the individual, society, and the environment.

Essential Questions

What is the Appalachian Trail?

Who owns the Appalachian Trail?

How did the Appalachian Trail get built?

Where is the Appalachian Trail in Vernon, New Jersey?

What other public lands are there in Vernon, New Jersey?

What can I do to protect the Appalachian Trail and the environment?

How can I teach others about protecting the Appalachian Trail?

What organizations are available in Vernon that will help me to learn about the Appalachian Trail and the natural environment in the Vernon area?

Skills and Habits of the Mind

Skills

1. Science skills: observing, collecting data, hypothesizing, concluding, classifying.
2. Social Studies skills: mapping, using GPS technology, participatory government, civic-mindedness.
3. Language Arts skills: persuasive writing, journaling, oral presentation, and poetry.
4. Math skills: estimating, calculating, and measuring.

Habits of the Mind

1. Students will become long-term stewards of the environment and the Appalachian Trail.
2. Students will become civic minded and have the experience in contacting local officials, writing editorials, attending local government meetings, and presenting information.
3. Students will make healthy choices to engage in outdoor activities like hiking and snowshoeing that promote physical fitness.

Community Opportunities

Opportunities and needs that exist in our schools and community to address the **big idea**: The Appalachian Trail and other public lands belong to *we, the people*, and are important natural resources that should be explored, enjoyed, valued, shared, and protected.

- Educate peers, younger students, parents, and community about the Appalachian Trail and Leave No Trace Principles.
- Communicate the need for a parking lot at the Pochuck Boardwalk section of the Appalachian Trail.
- Environmental monitoring of water, flora, fauna, invasive plant species.

Community Partners

- Walkill River Wildlife Refuge
- Wawayanda State Park
- Highpoint State Park
- New York/New Jersey Trail Conference
- Tubbs Snowshoes Teacher Curriculum
- Vernon Township Town Council/ Mayor Carew
- Teacher and parent volunteers for activities

Unit Projects

1. Sixth Grade after school hiking and environmental education club.
2. Water testing for World Wide Water Monitoring Day at Pochuck Creek along Boardwalk section of the Appalachian Trail in October. Then water testing of a variety of other water types and locations in Vernon.
3. Creation of a Quest to educate community about the Appalachian Trail and Leave No Trace principles.
4. Creating "Hiker Harry/Henrietta" figures and using Flip-cameras to photograph and video tape him/her engaged in Leave No Trace activities and other services along the Appalachian Trail to post to a Vernon Trail To Every Classroom Web Page in order to educate the public.
5. Study biodiversity of flora and fauna of our region.

Winter Activities

6. Teaching students to snowshoe using the Tubbs Teacher Curriculum and purchase of snowshoes for club through grant.
7. Creating an Our Town simulation using Box City boxes and curriculum to learn about land use.

Models

- Teacher created Quest along school trail to introduce students to Questing.
- Teacher created Hiker Harry dressed as a hiker.
- Member from New York/ New Jersey Trail Conference to share experiences as ridge-runner and model essential backpack equipment for hiking.

Assessment of Students

A school bulletin board will be created to display pictures and student reflections about activities, use of graffiti before and after activities, oral and written student reflection in journals, success of student made Quest.

Evaluation of Unit

Teachers involved in project will use observation and questioning during activities, discussion with adult partners after and during activities, written reflection after each activity.

Final Celebration

A family hike and picnic at Wawayanda State Park in Vernon, New Jersey in spring 2009.

Local newspaper coverage of family hike highlighting student accomplishments.

Time Line of proposed events- September 2008-June 2009

September 2008

Organize club. Membership drive over morning announcements. Application, permission slip, after school activity bus forms. Forty-six students sign up. Decision is made to keep all and hike them in two groups on alternating weeks.

October 2008

October 5-Initial meeting to organize members into Group A and Group B with approximately 20 members each. Leave No Trace activity.

October 16-Group B to Pochuck Boardwalk. Test water for World Wide Water Monitoring Day.

October 22-Group A to Pochuck Boardwalk. Test water for World Wide Water Monitoring Day.

October 29-Group A and B at school. Record data on WWMD data base. Head, Heart, and Hands- What makes a good hiker body tracing and graffiti in groups of 5. Create individual "Hiker Harry" and explain Web page plan to teach others about Leave No Trace and Appalachian Trail.

November 2008

November 12-New York/New Jersey Trail Conference Volunteer to model backpack essentials, share ridge-runner experience, and Leave No Trace principles.

December 2008

Lesson Plan- Water Pollution and Filtering Processes. What is a watershed?

Research Appalachian Trail information using Internet in computer lab at school. Discover facts to use for Quest to teach others about Appalachian Trail.

January 2009

Use Box City curriculum and boxes to explore land use, public land, create Our Ideal Town.

February 2009

Teacher made Quest. Explore Questing examples. Plan student made Quest for Boardwalk section of AT.

Snowshoeing at Lounsberry Hollow Middle School.

March 2009

Begin creating Quest at Boardwalk AT.

April 2009

Continue Quest

Hike AT at Wawayanda State Park, test water, identify macro-invertebrates.

May 2009

Walkill River Wildlife Refuge- Invasive species or other service-learning project.

June 2009

Final celebration- Family Hike- Quest or Wawayanda AT section.

Sample Lesson Plans

LESSON TITLE: Water Testing for World Water Monitoring Day

CURRICULAR AREAS: Science, Language Arts, Math

GRADE LEVEL: 6,7,8

ENDURING UNDERSTANDING: As citizens of the world we can do our part to help monitor water because water is essential for life.

ESSENTIAL QUESTIONS:

- What is World Water Monitoring Day?
- Why is it important to monitor water quality?
- What tests can we perform on water?
- How do we test the water?
- What do the results of the tests we perform mean about the quality of the water?
- What factors affect the results of the water testing?

ASSESSMENTS: Discussion of findings, journaling after testing water, graffiti what we know about water testing and water quality at subsequent meeting after water testing, World Water Monitoring Day Games and Activity Sheets available on WWMD Website.

STANDARDS:

- CCCS 5.1 All students will develop problem-solving, decision-making, and inquiry skills, reflected by formulating usable questions and hypotheses, planning experiments, conducting systematic observations, interpreting and analyzing data, drawing conclusions, and communicating results.
- CCCS 5.5 All students will develop an understanding of the structure, characteristics, and basic needs of organisms and will investigate the diversity of life.
- CCCS 5.10 All students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.
- CCCS 3.2 All students will write in clear, concise, organized language that varies in content and form for different audiences and purposes.
- CCCS 4.5 All students will use mathematical processes of problem solving, communication, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

GOALS: To develop an understanding of the value of our natural resources, to protect, conserve, and monitor the environment and ecosystems for future generations.

MATERIALS:

- Water testing kits (World Water Monitoring Day Kits) 1 for every 5 students
- Data Collection Sheets
- Pencils
- Journals
- Rubber gloves
- Information posters on Four WWMD Water Quality Indicators (teacher made using info from <http://wwmd.org>)
- First-aid kit
- WWMD Participant Certificates, 1 for each participant (<http://wwmd.org>)
- WWMD Activity Sheets and Games, 1 for each participant (<http://wwmd.org>)
- Invertebrate Identification Sheets

ACTIVITY:

1. Choose and register a site for water monitoring at <http://wwmd.org>. We chose to test the Pochuck Creek at the Pochuck Boardwalk section of the Appalachian Trail in our hometown of Vernon, New Jersey.
2. Order one water testing kit for every five students. We have forty-six students who we divided into two groups to take them out on two separate days. Four kits were sufficient; five would have been better.
3. Arrange for transportation, permission slips, and adult supervision
4. Divide students into groups of five or six.
5. Take students to location. The creek is a ten-minute walk along the boardwalk. At site hand out data sheets and allow students time to assess area filling information on data sheets. (See Appendix A)
6. Demonstrate use of GPS to find exact latitude and longitude of location. Stress importance of using this information for the World Water Monitoring Day project as information is from all over the world, and latitude and longitude is an international language.
7. Briefly use teacher made posters to explain water quality indicators: temperature, dissolved oxygen (DO), pH, and turbidity (clarity). Briefly discuss effects change these indicators have on plant and animal life. Pass out Invertebrate Identification Sheets to record any aquatic life that might be found at fall time of year.
8. Discuss safety tips, such as wearing gloves and proper disposal of test samples. (<http://wwmd.org>)
9. Test water for the four indicators in groups under adult supervision. Each student should have a turn performing tests and recording data.
10. Collect data from groups and compare/discuss results. Ask students what would be the best way to report data from four groups. (Average the results) Ask for volunteers to work on averaging the results and bringing them to next meeting. (Tell students that at the next meeting we will use overhead data projector so all can participate in the posting of data on World Water Monitoring Day site together with group.)

11. Before leaving monitoring site reinforce Leave No Trace principles, and clean up any visible trash in trash bag using gloves.
12. Have groups stop along boardwalk on way out to write reflections in journal for about ten minutes. Students may write, illustrate, web, write poem.
13. Hand out WWMD Participation Certificates and Activity Sheets and Game Sheets for students to complete for next meeting. (<http://wwmd.org>)

FUTURE: Students will perform other water tests in spring at a variety of sights along AT in Wawayanda State Park to include pond, wetland, lake. Students will compare results. In addition, record invertebrates and other aquatic life found in spring and compare to aquatic life observed in the fall.

LESSON TITLE: Biodiversity in our community

CURRICULAR AREAS: Science, Language Arts

GRADE LEVEL: 7

ENDURING UNDERSTANDING: The air we breathe, the water we drink, and the foods we eat are fundamental to our existence. These essential life supports depend on an intricate web of life involving the interactions of millions of different animals, plants, fungi, and microscopic organisms. All of these organisms provide numerous ecological, economic, and aesthetic benefits. As members of the community, students recognize the importance of preserving the biodiversity along the Vernon section of Appalachian Trail.

ESSENTIAL QUESTIONS:

- How many different organisms will we be able to identify from one location?
- Why is it important to understand the habitat needs for different organisms?
- How will we be able to observe microorganisms?
- Why is it important to understand biodiversity conservation?
- What can we do to reduce our “ecological footprint”?

ASSESSMENTS: Use prior knowledge of the general characteristics of organisms to classify the data gathered on simply invertebrates, journaling of organisms during and after field trip to water area, create a field guide or species at a glance booklet of invertebrates detailing their environment and food source, and to evaluate the biodiversity of organisms.

STANDARDS:

- CCCS 5.1 & 5.2 All students will be able to use the steps of the scientific method and develop a workable hypothesis, develop charts and graphs, interpreting and analyzing recorded data and communicating results, use lab equipment to identify microorganisms, identify basic structures of representative protists and simply invertebrates.
- CCCS 5.5 All students will gain an understanding of the structure, characteristics, and basic needs of organisms and will investigate the diversity of life.
- CCCS 5.6 & 5.7 All students will identify the kingdoms presently used to classify organisms using key terms and observation skills.
- CCCS 5.10 All students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.
- CCCS 3.2 All students will write in clear, concise, organized language that varies in content and form for different purposes to display relevant information.
- CCCS 3.3 All students will use critical thinking, decision making, and problems solving skills; use information, technology and other tools; speak in clear concise, organized language for oral presentations and group discussions.

- CCCS 3.4 All students will read and use printed materials from other disciplines such as Science and listen actively to information from a variety of sources in a variety of situations.

GOALS: To describe the characteristics and identify microorganisms: Protists. To describe, identify, and classify organisms based on their characteristics as macro-organisms (simple invertebrates): Mollusks, Annelid Worms, and Arthropods.

MATERIALS:

- Journals and sketch paper
- Pencils and colored pencils
- Copies of “Freshwater Investigations Data Sheet”
- Copies of “Field Work Do’s and Don’ts”
- “Keys to the Kingdom” - student created chart that lists characteristics to help identify simple invertebrates
- Nets to collect macro-invertebrates and other aquatic species
- Hand wipes
- Non-latex dissecting gloves (1 box)
- Garbage bag to dispose used gloves and hand wipes
- Containers with lids for water sample (1 per every 2 students)
- School digital camera
- First aid kit
- Microscopes (in class)
- Plastic slides and cover slips (in class)
- Water droppers (in class; 1 per every 2 students)
- Graph paper (in class)
- Computers (in class)

ACTIVITY:

1. In class, students create chart, “Keys to the Kingdom” to list characteristics of organisms and review “Field Work Do’s and Don’ts” sheet.
2. Arrange for transportation to a section of the Appalachian Trail: Pochuck Boardwalk, Vernon, NJ. Acquire parent permission through the completion of school field trip form.
3. Divide students into groups of two or three.
4. At the Pochuck Boardwalk, students are organized and briefly given information about their walk along the boardwalk to Pochuck Creek.
5. Students take a “silent” walk; stopping periodically to record in their journals any sights or sounds of nature that they observe.
6. In groups of two or three, students observe the shoreline and surrounding areas of Pochuck Creek for identifying the assigned invertebrates: Mollusks, Annelid Worms, Arthropods. Inform students to use nets and wear dissecting gloves when gently handling organisms.
7. Collect data in groups. Identify, draw, and label organisms. Record organisms on digital camera.

8. Collect water sample and secure lid on container; mark each container with group names.
9. Monitor area for Leave No Trace principles; dispose of dissecting gloves, wet wipes in garbage bag.
10. On return trip, repeat the “silent” walk and stop along the way to reflect on the organisms observed and update notes. Students may create an original work of poetry, drawings of the area, or formulate questions for future group discussions.
11. In classroom, individual groups work to create their own field guides. Computers and textbook may be used to add pertinent information.
12. Whole class compares the organisms observed and discusses the diversity of simple invertebrates listed on data table.
13. Next day activity: groups prepare a slide and use a microscope to observe and identify microorganisms found in the water samples. Observations and ways microorganisms move are recorded in the group field guides or species at a glance booklet.

Virtual microscope activities:

<http://micro.magnet.fsu.edu/primer/virtual/virtual.html>

<http://school.discovery.com/lessonplans/interact/vemwindow.html>

<http://school.discovery.com/quizzes6/muskopf/microscopy.html>

14. Groups evaluate how to share their findings with the whole class; posters, power points (including digital photograph), class worksheet activities, species charts/graphs, species life cycles/adaptations.
15. Continue discussions on biodiversity and the impact of humans on the environment (ecological footprint).

FUTURE: Students continue to use inquiry skills to learn about other kingdoms, including plant kingdom. Class will return to Pochuck Boardwalk for “Creature Connections” scavenger hunt activities to describe the connections among plants, animals (including fish, reptiles, amphibians) and the environment, as well as, specific ways that people connect to the natural world. Use the fieldtrip experience and “Future Worlds” activity to analyze the importance of biodiversity conservation in comparison to other personal, regional, and/or global needs and wants.

