

The State of Environmental Education in Rockland



**A Report by Keep Rockland Beautiful
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Forward and Acknowledgements

This report germinated with Keep Rockland Beautiful's work in Rockland's schools and our eagerness to share the many inspiring examples of environmental education throughout the county. The following pages acknowledge many, although far from all, of these examples. It outlines some of the real challenges to implementing environmental education throughout the public school system. While our focus is primarily on public schools, there are many examples of environmental education being implemented in the private schools. We have included a highlight of one such program in this report.

It is our hope that this report can serve as a resource for teachers, parents, school administrators, and others with a stake in environmental education and upon whose collaboration environmental education ultimately depends. Environmental education thrives through partnerships among schools, nonprofit organizations, independent environmental educators, businesses, government agencies and volunteers from the local community. It is our sincere hope that this report contributes to the growth of the partnerships – both formal and informal – that help meet the increasing demand for environmental education.

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S.E.E.R. REPORT

TABLE OF CONTENTS

Forward and Acknowledgements	2
Table of Contents	3 - 5
Introduction: Defining Environmental Education	6 - 7
Part I: Environmental Education in Rockland County Schools: A Review of Successes, Challenges, and Strategies	
District-Wide Initiatives	8 – 13
Curriculum-based Environmental Education	
Facilities Greening: Energy Conservation, Waste Reduction & Spaces for Outdoor Learning	
Celebration	
District-Community Partnerships	
School-based Initiatives	13 – 20
Curriculum-Based Environmental Education: Stimulating Learning & Inspiring Stewardship	
Facilities Greening: Involving Students in Sustainable Practices	
Celebration: Recognizing School Greening Initiatives & Sharing in Enriching Events	
School-Community Partnerships: Relationships that Support Environmental Education & Foster Civic Engagement	
Challenges and Recommendations	20 – 26
Frameworks to Support & Reward Environmental Education	
Green Teams	
Integration of Environmental Education into Curriculum	
Facilities Greening	
Celebration	
School-Community Partnerships	
Moving Forward	

Part II: Highlights of Environmental Education in Rockland Schools

Curriculum-based Environmental Education	28 - 33
A. Mac Arthur Barr Middle School	
Blue Rock School	
BOCES CTEC	
Cottage Lane Elementary School	
Highview Elementary School	
Pearl River High School	
Sloatsburg Elementary School	
Spring Valley High School	
Suffern High School	
Upper Nyack Elementary School	
Energy Conservation, Waste Reduction and Recycling	34 - 36
A. MacArthur Barr Middle School	
Congers Elementary School	
Fieldstone Secondary School	
Stony Point Elementary School	
Suffern Middle School	
Gardens and Farm-to-School Connections	37 - 44
BOCE CTEC and Jesse J Kaplan School	
Chestnut Ridge Middle School	
Franklin Avenue Elementary School	
Haverstraw Middle School	
Hillcrest Elementary School	
Lincoln Elementary School	
Link Elementary School	
Margetts Elementary School	
Nyack High School	
Ramapo Freshman Center	
Summit School at Ramapo High School	
Upper Nyack Elementary School	
Valley Cottage Elementary School	

Enriching Events

Earth B.E.A.T.	45 - 47
Cottage Lane Elementary School	
Evans Park Elementary School	
Fieldstone Elementary School	
Franklin Avenue Elementary School	
Link Elementary School	
New City Elementary School	
Thiells Elementary School	
Clarkstown Environmental Summit	47
Earth Day Celebrations	48
BOCES Earth Day	
Jesse J. Kaplan Virtual Walk	
Great American Cleanup	49
North Rockland Central School District	
Service Learning	50
North Rockland High School	

Part III: Resources for Environmental Education

Environmental Education Organizations and Programs in Rockland County	51 - 54
Citizen Action Organizations	55
Environmental Education Organizations and Programs in the Region	56 - 62
Nature Centers, Farms & Farmers Markets in & around Rockland	63 - 65
Nature Camps in & around Rockland	66 - 67
Independent Environmental Educators	68
Professional Development Opportunities for Educators	69 - 71
National and International Organizations and Web Resources	72 - 80

Introduction: Defining Environmental Education

We are living in a time of unprecedented environmental challenges and of exciting new opportunities for transformative change that can move us onto a path toward healthier, more sustainable communities. At the forefront of national discourse is how to prepare our country to be globally competitive and environmentally responsible. Environmental education in this nation's schools is critical to preparing our youth to be the informed and engaged citizens who will build a strong, balanced and sustainable future. The following report reviews the current status of environmental education in Rockland County schools and provides some recommendations, based on our vantage point as a nonprofit organization, that support school-based environmental education. We intend it as both a celebration of local efforts, and a call for a more systematic and explicit commitment by all involved.

How do we define environmental education at its best? Environmental education fosters eco-literate individuals who will make healthier choices for themselves and for their communities. To be more specific, environmental education includes a scientific understanding of the natural world and of the interrelationships between the natural, social, and economic systems that are integral to both human welfare and the health of the environment. Environmental education is of necessity systems-based and multidisciplinary – it is not the purview of any one academic field, but rather requires students to draw upon multiple sources of knowledge to understand where environmental problems come from and how to solve them.¹

At its best, environmental education utilizes the entire school community as a living laboratory, with students learning both indoors and outdoors, getting involved in the sustainable operation of school facilities and the care of schoolyard habitats, and connecting their lessons to local ecosystems, neighborhoods, and businesses. In this sense, environmental education is often place-based, hands-on, and project-oriented. While not all environmental lessons take place outdoors or through hands-on applications in the school and nearby community, there is wide agreement that these kinds of experiences are essential components because they provide opportunities for discoveries and applications that give meaning to content and create memorable learning experiences.

The benefits of environmental education are many fold. To begin with, students' academic performance improves:

- *Their behavior improves, leading to fewer discipline and classroom management problems.*
- *They perform better on standardized reading, math, science, and social studies tests.*
- *Their critical thinking and problem-solving skills improve, and they are better able to make connections and transfer knowledge from familiar to unfamiliar contexts.*
- *They retain the knowledge and skills they've acquired.*²

¹ This report equates environmental education with that of education for sustainability. A number of programs use the term Education for Sustainability (E/S) to define engaging education that stresses an understanding of the interconnections between social, economic and environmental systems in order to foster sustainable development. A definition for sustainable development first appeared in the World Commission on Environment and Development's Brundtland Commission report on *Our Common Future*: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (Oxford: Oxford University Press, 1987)

² Supporting research can found at <http://www.nwf.org/~media/PDFs/Eco-schools/academicbenefits10-16-09.ashx> ; <http://www.ecoacademics.blogspot.com/>; <http://www.maeoe.org/greenschools/application/2012%20application/Maryland%20Green%20Schools%20Award%20Program%20Reference%20Guide%202012.pdf>

There is a growing body of evidence that illustrates not only how students benefit from environmental education academically, but physically and emotionally as well. In his book, *Last Child in the Woods*, Richard Louv³ coins the term “nature deficit disorder” to describe what happens to young people who become disconnected from their natural world. He links this lack of experience in nature to disturbing childhood trends, such as the rise in obesity, attention disorders, and depression. Louv builds upon and cites well-established research that demonstrates how children learn best when engaged in educational experiences that involve multiple senses, movement, exploration and discovery in the outdoors.⁴

Students are not the only beneficiaries of environmental education in our schools. Teacher stress is greatly reduced when students are engaged and motivated learners. In turn, teachers are motivated to invest more of themselves in the classroom as they share with students the rewards of a more meaningful educational experience. Anticipation of this positive feedback loop motivates teachers to go beyond their textbooks to incorporate more engaging, hands-on activities inside and outside the classroom.

This report describes the current state of environmental education in Rockland County from our vantage point as providers of environmental programming, training, and special events to local schools. We then make some recommendations, highlight dozens of inspiring initiatives in the schools, and finish with a directory of organizations and web resources that will be of great use to teachers. In Part One, we organize the overview into four broad categories that capture most of what is going on in schools and are considered by many experts to be pillars of environmental education:

- Curriculum-based Environmental Education – when inquiry-driven, hands-on learning about the human-environment connection is integrated into class lessons
- Facilities Greening – when schools implement programs for waste reduction, recycling, and energy conservation or install gardens, nature trails, or outdoor classrooms
- Celebration – when schools make time to recognize and promote school greening efforts and to celebrate environmental awareness as a whole community
- School-Community Partnerships - when schools take advantage of the many opportunities to partner with local organizations or businesses in order to realize environmental education goals

That these categories of environmental education overlap and support each other is testament to the integrative and interdisciplinary nature of environmental education and the many opportunities to teach about the environment.

³ Louv, Richard, *Last Child in the Woods*, Algonquin Books of Chapel Hill, 2008

⁴ Supporting research can be found at <http://www.englishoutdoorcouncil.org/research.in.outdoor.learning.html> ;
<http://www.childrenandnature.org/research/>

Environmental Education in Rockland County Schools: A Review of Successes, Challenges, and Strategies

Rockland schools are pursuing a wide range of exciting programs and projects in environmental education. Teachers are including engaging, inquiry-driven lessons that not only teach about the elements of nature, but help to illustrate the important, dynamic connections between ecological, social and economic systems. PTA parents and student clubs are initiating and overseeing a variety of school greening initiatives from recycling to gardens to awareness raising events. Districts are implementing energy conservation programs that can save millions of dollars, while providing opportunities for students to utilize their schools for place-based learning.

Nevertheless, examples of curriculum-based environmental education and of successfully sustained school greening initiatives, especially those that consistently involve students, are still more the exception than the norm. There are a number of challenges to fully implementing environmental education. These begin with a lack of clear academic guidelines or standards at the state or national level to support environmental literacy. They include some of the more general challenges to providing quality educational experiences to students in the public school system, such as those that come with growing class sizes, limited time and resources, and the pressures of preparing students for successful completion of standardized state tests.

This section gives an overview of the impressive activities taking place both district-wide, and at the scale of individual schools. In our conclusion, we present some of the challenges to implementing environmental education in our schools, and provide recommendations for addressing these challenges through frameworks that will support an educational experience that prepares students to build a healthy, sustainable future.

District-wide Initiatives

The main actors in the story of environmental education are the teachers, PTA volunteers, custodial staff, administrators, and community partners who initiate, support and sustain activities in their schools. However, the work of local schools occurs in the context of decisions and policies made at the district and state level, not to mention the federal level as well. Thus, we begin our review of Rockland's environmental education activities with a brief look at the ways in which school districts, statewide and national education policies are affecting the development of environmental education locally.

Curriculum-Based Environmental Education

NYS Learning Standards and the Environment

Academic curriculum in each of Rockland County's eight school districts and their schools is guided by the New York State Learning Standards, common core curriculum guidance documents, and the aligned State assessments that have been developed by the NYS Board of Regents. The learning standards that focus on knowledge and understanding of natural systems fall primarily under Standard 4 for Math, Science, and Technology Education, which covers the Physical Environment and the Living Environment. Standard 4 outlines a total of twelve Key Ideas that are explored with increasing levels of depth and complexity from elementary to commencement. These Key Ideas include an understanding of how plants and animals, including humans, depend on each other and their physical environment, and of how human decisions and activities have a profound impact on the physical and living environment. While environmental education is addressed primarily in state standards for the natural sciences, Standards for Social Studies and for Health, Physical Education, and Family and Consumer Science also

call for an understanding of the interconnections between humans and their environments. The diversity of ways in which environmental awareness is included in state standards reflects the fact that virtually every profession and field of inquiry can make a valuable contribution to the sustainable management of the Earth's resources, and that the health of the environment is integral to the health of individuals and society. The human/environment connection is an engaging context in which to teach all the disciplines, and has, in fact, been successfully used as an integrating concept in a number of schools throughout the country.⁵

As noted, teaching methodologies play a critical role not only in engaging students in the learning process and facilitating the acquisition of knowledge, but in helping students to develop the skills, and the enthusiasm, for applying learning to real-world problems. Hence, the focus among environmental educators on learning that incorporates exploration, discovery, inquiry and the application of critical-thinking skills to environmental issues. These learning modalities have, in fact, been encouraged in core curriculum guides designed to help teachers meet the current Learning Standards for Math, Science, and Technology. Initiatives to develop new science standards, such as the NYS Science Initiative and National Research Council's Framework for K-12 Science Education Standards, emphasize inquiry-centered learning as well.⁶ In 2010, the New York State Board of Regents adopted the Common Core State Standards (CCSS) for Mathematics and CCSS for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects.⁷ These new standards emphasize higher-level thinking skills, real-world problem-solving and applications, and an integrated approach to literacy across the disciplines. However, both the current subject standards and the new Common Core Standards leave the use of active learning modalities, such as hands-on projects and fieldwork, largely to the discretion of schools and their teachers.

Needless to say, curriculum standards are in the midst of change, change that represents an opportunity to support environmental education in the schools. While New York State Standards do not make environmental literacy a graduation requirement, as has recently been achieved in Maryland, there is clear movement at both the state and national level toward supporting hands-on, inquiry-based learning that stresses the connection between human activity and ecological systems. Indeed, federal recognition of the value of environmental education is reflected in the recent formation of the Department of Education's Green Ribbon School program to promote "project-based, place-based, and interdisciplinary learning about the key relationships between dynamic environmental, energy, and human systems" and to address "environmental impact and energy efficiency and healthy school environments."⁸

⁵ The EIC Model™ is an example that has been used in almost 150 schools in 10 states. It is based on research, reported in *Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning* (1998 & 2002). www.seer.org

⁶ <http://www.p12.nysed.gov/ciai/mst/sci/initiative.html>; <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=13165>

⁷ All school districts are expected to have their local curriculum aligned to the [P-12 Common Core Learning Standards for English Language Arts & Literacy](#) by school year 2012-13. During the 2012-13 school year, student achievement expectations for English Language Arts will be based on the P-12 Common Core Learning Standards for English Language Arts & Literacy. The timeline for district implementation is available at <http://usny.nysed.gov/rttt/docs/ccsstimeline.pdf>

⁸ <http://www2.ed.gov/programs/green-ribbon-schools/index.html>

District Support for Curriculum-Based Environmental Education

A number of Rockland's school districts are developing curriculum maps for core courses that include both environmental knowledge and the inquiry-driven learning processes that are critical to this environmental perspective. For example, Clarkstown Central School District recently adopted, and is providing professional development training for, Science 21, a K-6 integrated science sequence developed by Putnam/Northern Westchester BOCES. This curriculum seeks to provide a balance between science process and content. There is some specific focus on the human-nature connection, for example, a third grade unit "explores the interdependence of humans and butterflies."⁹ The Ramapo Central School District's 5th grade curriculum map includes a unit on the Living Environment that examines aquatic ecosystems and the relationship between human activity and water quality. This unit provides for hands-on learning inside and outside the classroom. The Pearl River Central School District's curriculum map for second grade includes a FOSS¹⁰ unit on life cycles of animals that has students hatching and observing chicks in the classroom, and potentially, making connections to the sources and conditions of food production.

At the same time, districts continue to offer electives that give students the opportunity to explore issues around the human-environment connection. Environmental Science is offered by nearly all of the county's high schools. It focuses on the interrelationships of the natural world, and on environmental issues, both natural and human-made. The course embraces topics from different areas of study and often incorporates fieldwork.

No doubt there will be ever more examples of experiential environmental learning in Rockland as district superintendents work to meet expectations that include an increased emphasis on inquiry-centered STEM curriculum and the incorporation of new Common Core standards. To aid in this effort, there is a growing abundance of environmental education curriculum resources that make explicit the ways in which their environmental education units satisfy state standards. These resources are often interdisciplinary and process-driven, emphasizing inquiry and critical thinking skills, discovery and outdoor exploration. The Ramapo Central School District's new STEM unit on the Living Environment that was developed by the Westchester company, *It's About Time*, is an example of one such resource.

Lastly, since BOCES (the Board of Cooperative Educational Services) serves all local school districts, it bears mentioning that environmental activities are flourishing at BOCES within the vocational and technical programs in the areas of green facilities, events and community partnerships as well. In terms of the curriculum-based innovations that we have been discussing here, BOCES programs in the building, auto repair, culinary, beauty and other professions have all incorporated "green" practices of one sort or another. For example, with support from Orange and Rockland Utilities, carpentry, electrical and plumbing students collaborated to build an energy-efficient demonstration house on the BOCES campus. More information on BOCES' environmental initiatives can be found below in our discussion of school-based environmental education efforts.

⁹ Science 21 Curriculum Maps : <http://www.pnwboces.org/science21/CurriculumMaps.html>

¹⁰ FOSS is a research-based science curriculum for grades K—8 developed at the Lawrence Hall of Science, University of California at Berkeley. FOSS units are premised on the belief that the best way for students to appreciate the scientific enterprise, learn important scientific concepts, and develop the ability to think critically is to actively construct ideas through their own inquiries, investigations, and analyses. The FOSS program was created to engage students in these processes as they explore the natural world. <http://www.fossweb.com/>

Facilities Greening - Energy Conservation, Waste Reduction, and Spaces for Outdoor Learning

All of Rockland's school districts recognize the value of facilities greening and are actively seeking ways to reduce energy, materials consumption and waste. The East Ramapo Central School District even specifies 'greening' in its district goals. The "greening" of school facilities holds the promise of saving thousands of dollars as well as involving the entire school community in learning and practicing sustainable behaviors. The "gold standard" for environmental education is for facilities "greening" processes to include students directly in the monitoring of environmental impacts from school operations and the design and implementation of "green" projects, such as energy conservation, recycling and habitat restorations. This student involvement is what can connect green facilities to the curriculum-based environmental learning discussed above.

Saving Energy

Clarkstown Central School District is an example of a district that has embraced energy conservation in several ways. Like many districts in the county, it has signed on to a performance contract that has provided for capital improvements, such as a cogeneration facility at Felix Festa. The district is also working with Texas-based, Energy Education, Inc. (EEI) in developing and implementing a behavior-oriented energy conservation program. In 2008, they hired an Energy Educator/Manager to work with Energy Education, Inc. to implement a program that educates and calls upon students, teachers, and administrators to reduce their energy consumption. In addition to following guidelines established by EEI, the district has included strategies outlined in the New York Collaborative for High Performance Schools (NY-CHPS) guidelines. The district saved more than \$2 million over a four-year period as a result of energy conservation measures. The first years of the program focused primarily on promotion in the schools, staff education, and on establishing an energy consumption tracking system. With initial enthusiasm for the conservation campaign leveling off, the district is challenged to continue savings through consistent conservation efforts. A program for systematically involving students in recycling and energy conservation efforts has not yet been developed.

In 2005, the North Rockland Central School District took part in a program through Orange and Rockland Utilities that resulted in the installation of photovoltaic arrays on several of their school rooftops. These panels have produced thousands of kilowatt-hours of carbon-free electricity over the past several years and represent opportunities for integrating hands-on learning into classroom curriculum. For example, teachers at Fieldstone Secondary School can take advantage of real time monitoring software by SunViewer and Heliotronics. These companies also provide lessons that are matched to NYS standards.

Both the Clarkstown and North Rockland School Districts recognize the value of demonstrating leadership in environmental initiatives. Clarkstown Central School District signed on to the Mayor's Climate Pledge, and North Rockland Central School District's Board of Education is considering the adoption of a Climate Smart Pledge that was developed by the district's Environmental Working Group.

Reducing Waste

All Rockland school districts have carting contracts for at least some of the recyclable material in their schools, and all are grappling with the challenge of getting these materials from their classrooms, offices, cafeterias, and kitchens to the Materials Recovery Facility at the Rockland County Solid Waste Management Authority (RCSWMA). The major challenge to an effective and efficient recycling program is consistent oversight and management at the school level. Many schools have taken on this

challenge through a variety of initiatives sponsored and overseen by motivated teachers, PTA, students and supportive administrative and custodial staff. RCSWMA emphasizes the fact that recycling is required by NYS law. They have an active outreach program to assist schools with program planning and design, training and education for custodial and kitchen staff, students, and teachers. RCSWMA also provides an educational and an interactive fieldtrip opportunity for students at the facility's Herb Reisman Environmental Center.

Districts are finding additional ways of saving energy and reducing waste, for example, by instituting a paperless flyer program. Many districts also purchase products made from post-consumer recycled materials.

Spaces for Outdoor Learning

Several districts have supported the development of venues for outdoor experiential learning. They have purchased and set aside property for nature trails or gardens and helped support the development of outdoor classrooms. They also acknowledge and celebrate the efforts of those teachers, parents, and students who spearhead and support these initiatives, for instance, on district web pages or at school board meetings.

The Nanuet Union Free School District recently purchased approximately 36 acres of property that was formerly owned by the New York Foundling. The green space, now called the Nanuet School District Outdoor Education Center (OEC), has been set aside for a variety of purposes including environmental studies, health and fitness activities, and community gatherings. The Center now has a pond, designed by students in the high school's Environmental Science classes, which will be used for a variety of hands-on activities tied to the curriculum. Science classes held in the OEC classroom can also learn about solar power by observing and monitoring energy produced by a photovoltaic system on the building's rooftop. One Nanuet High School teacher is seeking grants to support the development of a greenhouse and garden on the Center's grounds, and another has initiated a partnership with the Audubon Society that will utilize OEC in the preservation of the Eastern Bluebird, New York's state bird.

Celebration

While special events and programs for raising environmental awareness and celebrating school greening initiatives are generally spearheaded by individual schools, districts play a role in supporting these efforts. Events are sometimes posted on district websites, as are the efforts and achievements of PTA parents, students, and teachers. Districts also provide resources for events and facilitate reimbursement for programs through the CoSer (Cooperative Service) process.

District-Community Partnerships

Several districts support environmental education through school-community partnerships. Programs and projects range from developing outdoor learning spaces in and around the schoolyard to providing opportunities for fieldtrips out into nature or on a farm. For example, for the past ten years, the East Ramapo Central School District contracted with the Pfeiffer Center in Chestnut Ridge to give students from their schools the opportunity to experience The Outdoor Lesson at the Center's garden and farm. The contract, however, was not renewed in 2011.

The North Rockland Central School District has partnered with the Village of Haverstraw, the Rockland County Department of Health, Cornell Cooperative Extension, and the North Rockland Garden Consortium Haverstraw Community Garden in the development of the Haverstraw Community Garden.

All of Rockland's school districts are developing health and wellness policies that comply with the federal Child Nutrition and WIC Reauthorization Act of 2004. A district-level School Health Advisory Committee (SHAC) serves as a resource to the school-based health and wellness committees who are tasked with improving nutrition and physical activity in the school. These committees often recognize the benefits of environmental education that inspires students to make healthy food choices and to get out onto the trail or into the garden. School and district level Health and Wellness committee members are encouraged to participate in the Rockland County School Health and Wellness Coalition. The Coalition now has a Farm-to-School workgroup that supports school gardening efforts and is currently helping to promote the Farm to You Fest, a program supported by the NYS Department of Agriculture and Markets' Farm to School Program. The Coalition, which includes district food service managers, is also helping schools to explore avenues for bringing fresh local produce into school lunches to help boost their nutritional values and reduce their carbon footprint.

These school lunch initiatives face difficult challenges. School budget constraints limit fresh local options, and the large food vendors that are typically contracted by districts, such as Aramark, have established suppliers and transportation contracts that can take advantage of economies of scale, storage facilities, and established transport services across the nation. That being said, there is a positive trend in school lunch programs toward healthier meal options.

The Family Resource Centers (FRC) that operate in Rockland County's schools to support the health and well-being of students and their families have also been focusing more on the connection between nutrition, healthy eating and environmental awareness. These centers are components of the Rockland 21st Century Collaborative for Children and Youth, an organization representing a countywide partnership that includes school districts, early education and childcare centers, after-school programs, youth programs, teachers' centers, as well as many public and private agencies.

In 2011, Rockland 21C's annual symposium focused on *How Children and Youth Grow in a Stressful World*. One of the six offered workshops was dedicated to *Using Nature Inside and Outside the Classroom*.

School-Based Initiatives

As systematic, district level support for environmental education continues to evolve, there are a growing number of examples of leadership in environmental education at the level of local schools, where teachers, administrators, families, nonprofit organizations and environmental educators all play vital roles in making environmental education happen. This section outlines the many types of environmental education activities occurring in local schools. We have again divided these activities into four fundamental categories of environmental education: curriculum-based, green facilities, celebration, and school-community partnerships. We share more detailed examples of inspiring initiatives and programs in Part II: Highlights of Environmental Education in Rockland.

Curriculum-Based Environmental Education: Stimulating Learning and Inspiring Stewardship

In this section we describe some of the more common ways teachers are including environmental education in classroom-based school work in both required core science classes and in secondary level science electives. We also describe some of the ways environmental concepts are being used as a context for learning in other subject areas, such as math, social studies and English Language Arts. Lastly, we provide examples of the many ways students are learning through outdoor exploration and discovery, and hands-on participation in facilities greening.

Environmental Education in the Classroom

Environmental education takes shape in a variety of engaging ways inside the classroom. Whether it is by bringing nature into the classroom, providing opportunities for discovery or experimentation, inviting critical thinking or dialogue with peers at home or abroad, teachers are connecting students to nature and the dynamic relationships between human and natural systems.

- Many elementary school classes sprout seeds in bags or egg cartons, observe the lifecycle of beetles, or raise and release butterflies. Students in Pearl River hatch chickens. A number of elementary and secondary school classes observe and care for plants, insects, reptiles, small animals or fish in terrariums or aquariums. All of these experiences provide opportunity for the discussion of how habitats and natural systems are affected by human activity, and vice versa.
- Teachers are including projects that incorporate experimentation, design and collaborative work among peers. These have included everything from a drifter buoy that registers water temperatures to posters or videos promoting litter prevention and recycling.
- Guest experts, including local scientists, business people and artists visit classrooms to share their passion and knowledge on environmental issues, local history, and innovations in 'green' technologies. These individuals also sometimes volunteer their time to assist with the development of projects.
- Students are being asked to apply their scientific discoveries to real world issues. They write letters to newspapers and elected officials regarding concerns over local pollutants or global climate change. They create persuasive essays or design promotional advertisements to encourage the use of alternative energy.
- New media technology in classrooms provides opportunities to bring students closer to nature, people, and places all around the world. Many teachers use 'smart boards' to illustrate nature's wonders, conduct research, display interactive maps, or play instructional videos. Some classes have blogged with teachers in the field or participated in live chats with students on the other side of the world. Others make visits to the computer lab to do research or play games that teach about caring for the environment. A number of schools have webpages dedicated to environmental education resources and links.
- Many elementary school students prepare projects for a school Science Fair as part of their science curriculum. Students explore everything from the effects of run off and pollutants on aquatic ecosystems to the effects of climate change on food production and coastal developments.
- Elective science courses focus on ecological footprints, alternative sources of energy, and other issues of sustainability. A Bioethics course at Tappen Zee High School explores advances in the "new biology" and its ethical implication and potential to impact medicine, agriculture, industry, law, and the environment. Clarkstown South's Human Impact in Science course also looks at issues of sustainability. In Suffern High School's Technology course, students learn about the human impact of various types of energy production. At Clarkstown North, the Residential Construction/Energy course incorporates hands-on activities while learning about concepts and practices in energy conservation, as does a Robotics class at Suffern Middle School and a Technology class at Farley Middle School.

Environmental Education Across the Curriculum

Environmental issues are increasingly addressed in disciplines outside the sciences.

- A math teacher at Suffern Middle School has students do problem sets on garbage collection in the school.
- An English teacher at Fieldstone Secondary School teaches a unit on Environmental Issues. Another English teacher at Clarkstown South High School uses a walk in the surrounding woods to draw students into their reading of *Lord of the Flies*. English and environmental science teachers at Pearl River High School developed an interdisciplinary unit that has students investigating and writing throughout an excursion along the Hudson.
- At Nanuet Senior High School, speech class students are asked to write and speak about “The Human Impact of Being Green.”
- A 6th grade teacher at Suffern Middle School introduced “The Story of Stuff”, an animated documentary about the lifecycle of material goods that takes a critical view of excessive consumerism. The class also watched “Trees of Peace”, a film on The Greenbelt Movement in Kenya and India that promotes reforestation and women’s empowerment.
- Participation in Government and Syracuse Public Policy students, along with peers in Environmental Science courses, participate in Rockland P.L.U.S., a program that brings students, along with professional mentors, together to explore the social, economic and environmental issues around sustainable land use planning.

Experience in the Field

More and more teachers are utilizing the outdoors as a living classroom. Not only can outdoor experiences provide opportunities to acquire specific knowledge and understanding, but they can make the learning more exciting and increase its relevance to students and their communities. Green facilities, enriching events, and community partnerships - discussed in subsequent sections - all play important roles in creating opportunities to move the learning process beyond the classroom into schoolyards, nearby waterways and the broader community.

- Fieldtrips to local waterways such as the Hudson, Ramapo and Mahwah Rivers, provide opportunity for first-hand discoveries of life in aquatic ecosystems and for learning about the important role these waterways play in local history. For example, a number of elementary and secondary level classes participate in Day in the Life of the Hudson, an annual event organized by the DEC and Columbia University’s Lamont-Doherty Earth Observatory that brings students down to the Hudson River to examine various aspects of this rich environment.
- Some schools have streams on or near their properties where they can observe aquatic and riparian habitats, flora and fauna. For instance, students from Upper Nyack Elementary School put ‘leaf packs’ in a local stream to collect and observe aquatic insects. At Nyack High School, Environmental Science students sample insect larvae each spring at the nearby Upper Nyack Brook.
- Several schools have built ponds, cleared trails or developed designated outdoor classrooms where students can go to explore and observe, measure and calculate, write and illustrate.

- Teachers bring students out to explore, exercise and study along some of the many hiking trails that criss-cross Rockland County. For example, several teachers at Nyack make use of the Long Path that abuts the campus by bringing their classes outside to do nature-inspired storytelling or geocaching.
- Elective science courses, such as Environmental Science, get students outside to explore local ecosystems. Many participate in Day in the Life of the Hudson. Students in Clarkstown South's Marine Biology course visit the Marshlands Conservancy in Rye, NY on the Long Island Sound. There they seine, crab, and gather data from the salt marsh and shore habitats, and collect specimens for further research back in the classroom where they have aquariums set up for their catch.
- Nyack High School's new course on Botany and Horticulture involves fieldwork in the surrounding woodlands and in the school's organic garden.
- Several elementary and middle schools have overnight educational experiences that typically focus on team-building, and often include opportunities for hikes, nature study, or Birds of Prey demonstrations. For instance, third grade students from North Garnerville Elementary make a trip to Camp Addison-Boyce Camp every year, and 5th grade students from Montebello Elementary School have camped at the Sharpe Reservation in Fishkill.
- Fieldtrips to nearby farms, such as the Cropsey Farm in New City or Duryea Farm in Chestnut Ridge, increase students' awareness and appreciation for plant cycles and the seasons, and connect students to their community and local sources of food.

Facilities Greening : Involving Students in Sustainable Practices

Green facilities include programmatic efforts like recycling and energy conservation, and architectural efforts like gardens and trails. These programs and facilities provide spaces opportunities for curriculum-based environmental education in the classroom, but they are often pursued for their intrinsic values, such as reducing waste, lowering energy bills, beautifying the school, restoring habitat for wildlife, or expressing the value of community service. PTA volunteers, student clubs and individual teachers with a passion for sustainability often lead the way.

Gardens, Nature Trails and Wildlife Habitats

Gardens, nature trails, restored wildlife habitats all help to foster an appreciation and understanding of nature and offer multiple benefits to school communities, even when only sporadically connected to the classroom curriculum. School gardens are especially popular in both elementary and secondary schools. They serve multiple educational purposes, as well as, providing a focus for community involvement and school pride.

- Gardens are being used to support anti-obesity and healthy lifestyle campaigns that are the current focus of state and national educational policy. School Health and Wellness Committees (SHAC) are collaborating with PTA garden committees to support school gardens and learning about healthy food. These gardens, which are often organic, also provide the context for learning about agricultural practices that help sustain a healthy environment.

- A growing number of schools are using the “Seed to Salad” program of Cornell University Cooperative Extensions’ (CCE), which enables participating schools to plant, tend and eat spring vegetables before school gets out for the summer, thus avoiding the whole issue of summertime garden maintenance that is a challenge for school garden projects. The program includes activities that are linked to learning standards.
- Students and after school groups are donating their garden harvests to local food pantries and kitchens through the Garden Writers Association’s Plant a Row for the Hungry program, which is facilitated in here in Rockland by CCE.
- Many schools have butterfly gardens or wildlife habitats where students can observe the web of life. Some have been certified by the Wildlife Federation. Schools have also taken advantage of the Department of Environmental Conservation’s free seedling program that provides schools with native shrubs and trees.
- Gardens, nature trails, and farms are examples of rich contexts for cross-disciplinary learning, from science and math to social studies and art. For example, several schools now have their students make connections to their social studies units on early Native American and colonial history by planting the traditional “Three Sisters” (corn, beans, squash) in the courtyard garden. Gardens have also provided both ideas and materials for art projects. At BOCES, math and science students came together to study soil and plant growth on a rooftop garden.
- Gardens and nature trails are sometimes built in partnership with community groups and volunteers, such as the Scouts. A number of outdoor classrooms have been constructed for Eagle Scout projects. The Fitness Trail on the West Nyack BOCES campus, including its pond and restored habitat for turtles, was built in partnerships with various local government and community organizations. The trail includes wheel chair access, and specialized exercise equipment. It is frequently used by the entire campus community.
- Schools are using community service requirements and summer employment programs to meet garden maintenance needs, such as occurs with Ramapo High School’s courtyard garden, which has long been maintained during the summer by students from the Summit School in Nyack.

Energy Conservation, Waste Reduction and Recycling

Many schools are now embracing opportunities for energy conservation and waste reduction. Energy projects tend to be focused on saving money on heating and electrical bills through upgrades of equipment and facilities, and on encouraging conservation behaviors among students, teachers, and staff.

- Several schools have rooftop photovoltaic systems that generate carbon-free electricity. Clarkstown South High School, Fieldstone Secondary School, and the Nanuet Outdoor Education Center all have systems that are coupled with monitoring software that can be used by students in the classrooms. Students on the West Nyack BOCES campus learn from a working windmill, as well as their rooftop panels.
- A biodiesel experiment took place on the West Nyack BOCES campus, in which grease from the Culinary program was mixed with diesel fuel to save money on transportation services that BOCES runs for school districts. BOCES also recently introduced two hybrid school buses to their fleet.
- School clubs monitor lights and computers and make morning public service announcements that encourage waste reduction, recycling, and energy conservation.

While the majority of schools in the county have a carting contract, far fewer are consistently and effectively collecting all recyclable paper and containers. Teachers and students report that, while designated bins have been placed in classrooms and offices, they are often contaminated by a mixture of waste. In many cases, recyclables never actually make it to the proper containers outside. Parents and teachers are also often frustrated by the amount of waste generated within the school. Recycling is an increasingly popular “green” project in local schools. It is most often spearheaded by the PTA in the elementary school and by student clubs in the secondary schools. However, there are a growing number of Green Teams that have the active participation of teachers and supportive custodial staff and involve students in the routine collection of recyclables during schools hours. With the help of the Rockland County Solid Waste Management Authority, and in cooperation with custodial staff, more and more schools are reviewing school contracts with garbage carters and making sure recycling pickup is available for paper, cardboard, bottles and cans. School waste reduction and recycling activities include:

- Placing bins in classrooms, offices, and the cafeteria, and monitoring them for contamination to make sure the recyclables do not ultimately end up in the trash.
- Promoting waste-free lunch initiatives to discourage excessive packaging waste and to build synergy between recycling at home and recycling at school.
- Organizing ink cartridge, cell phone, battery, juice box and other specialized recycling drives aimed at raising awareness and funds through partnership with producers of consumer goods.
- Creating effective promotional campaigns for recycling within the school, such as designing posters, tracking progress with illustrative graphs, or running raffles and contests.

Celebration: Recognizing School Greening Initiatives & Sharing in Enriching Events

Schools use special events to motivate and focus school communities on environmental awareness. They also can use these occasions to celebrate school ‘greening’ initiatives and recognize those who are working to further environmental education in the school. Some examples include:

- Waste Free Lunch Day and recycling drives as mentioned above
- Arbor Day tree plantings and poster contests
- Cleanups of trash from school grounds and neighboring streets and streams undertaken in collaboration with Keep Rockland Beautiful and timed to coincide with Earth Day and the nationwide Great American Cleanup. Typically led by parents, these events often center on schools and reflect the school’s role as a hub of neighborhood and social networks.
- Earth Day events involving special presentations and activities, such as schoolyard cleanups, garden plantings, or movie presentations. At the BOCES Earth Day, schools and families are invited to participate in tours of the green facilities and projects completed by students in the vocational programs on the West Nyack campus.
- Assemblies are used to both kick off and celebrate school greening efforts. They have also featured everything from an up close and personal visit by a rescued wolf and his conservation companions to a presentation that utilizes a 6 foot diameter globe to engage students in learning about the earth’s rotation and protecting its natural resources.

- Earth B.E.A.T (Basic Environmental Awareness Training) is a Keep Rockland Beautiful program that provides schools with materials and coordination for an event that has students rotating through interactive, Eco-Stations focused on watershed and habitat protection, energy conservation, and waste reduction. These activities are designed to inspire stewardship and provide students with simple steps each can take to protect the environment.
- Extra-curricular participation in Science fairs, such as the countywide annual Science, Inventions, and Technology Exhibition, hosted by the Rockland Teachers Center Institute, or the Regional Tournament of the Science Olympiad, encourage students from Rockland and Westchester in the areas of environmental science and ecology.
- Health and career fairs provide students with information on environmental issues and access to environmental experts and organizations.

School-Community Partnerships: Relationships that Support Environmental Education & Foster Civic Engagement

One commonality of most of the above examples of environmental education in local schools is that these activities often involve partnership between teachers and one or more local organizations, such as the PTA, nonprofit environmental organizations, local businesses, independent providers of educational services and volunteer guest experts of many types. Schools value such community connections because of the multiple benefits they bring, from money to expertise, equipment, publicity, and parental support and involvement, all of which help to sustain environmental education and the school as a whole. Here are some of the ways local schools are engaging in community partnerships to sustain environmental education:

- Community service hour requirements for honor societies, churches, Scouts and sports teams, and some school courses drive students, and by extension, guidance counselors, parents and teachers, to seek out community partners who can supervise student volunteers. Overall, this process builds social capital for the school, and helps students to gain an appreciation for community involvement. It also helps students to build their resumes and college applications. There is growing recognition by schools and their districts of the value of these real-world, civic lessons. In the Nanuet school district, all students will have had learning experiences in which they perform community service and have gained exposure to a variety of occupations and settings by the end of middle school. Keep Rockland Beautiful is one of several local organizations that help students find volunteer opportunities in the environmental field. Some of these have included volunteering with KRB itself. For instance, many students gain community service credits by volunteering for the Great American Cleanup. Students from Clarkstown South High School's TV production course have partnered with KRB to produce informational videos and training tapes, and students in BOCES CTEC program partnered with KRB in the building of an Energy Bike Eco-Station for our Earth B.E.A.T. program.
- When community service is used as a teaching and learning strategy, it is service-learning. Service-learning integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities. Students in North Rockland High School's Aspira Club not only participate in community service projects, but also in a process that requires them to become aware of issues in their communities, analyze the possible ways of resolving these issues, and create action plans that address these issues in concrete ways.

- Some teachers include place-based activities in the curriculum, pushing students to interact with local experts, elders, historical sites and natural areas in order to complete class assignments.
- Teachers themselves sometimes have a passion for engaging in local environmental community service and will bring students along with them, for example to monitor baby eel populations in the Minisceongo Creek, a project coordinated by the NYS DEC and local environmental groups. “Citizen science” projects open to students locally include the eel monitoring project on the Minisceongo, Audubon’s Christmas Bird Count and blue bird house projects, water quality monitoring with the Rockland County Division of Environmental Resources, and the American Littoral Society’s coastal litter survey and cleanup.
- Green facilities are quite often supported by local businesses such as landscapers, nonprofit organizations like Cornell Cooperative Extension and Keep Rockland Beautiful and/or volunteer groups such as the Scouts and the PTAs.

Challenges and Recommendations

As the foregoing review shows, Rockland’s school districts and local school communities have been “bitten by the environmental education bug” and are pursuing this interest in the classroom, school yard and local communities. However, environmental education is not yet the norm in our schools. Students can go through the educational system with little exploration of the connections between natural and human systems. Many will graduate having few opportunities to step away from textbooks and worksheets to make discoveries outdoors or a chance to apply and test their knowledge through ‘greening’ practices in their schools or communities. This is because environmental education poses certain challenges for schools that would be the case for any growing and innovating educational process that entails integrating new lesson plans and teacher training and developing new patterns of behavior in the school. Other challenges, such as limited time for getting outdoors, discomfort with getting dirty or wet, or fear of poison ivy, are more specific to environmental education.

In this section, we describe some of the more common challenges that teachers and PTA leaders face in navigating their way toward providing routine and systematic environmental education and sustainability practices within school communities, and suggest a framework and strategies for addressing these challenges.

Frameworks to Support and Reward Environmental Education

Environmental education in our schools is best served when it is supported by goals, planning and coordination at the district and regional level. Districts can set the tone and provide support and encouragement for environmental education in their schools. They can provide leadership to help schools set clear, measurable goals, map out plans, and coordinate efforts. In some areas of the country, regional or district level Sustainability Education Coordinators have been established to guide and support environmental education efforts. For example, the Scarsdale Central School District established a part time position for a Sustainability Coordinator to help the district reach its goals of reducing its carbon footprint and integrating sustainability education into its schools. The district’s three part plan addresses Curriculum and Instruction, Behavioral Change, and Institutional Operations. Scarsdale is also a member of the Westchester Green School Coalition, established to help schools meet the goals established by the Westchester County Climate Change Task Force.

There are a number of models for fostering school ‘greening’ and environmental education in use in schools throughout the country. Two very successful models are provided by Eco-Schools USA and The Maryland Association for Environmental and Outdoor Education (MAEOE). Both of these begin with the establishment of a collaborative Green Team. The Eco-Schools model is used internationally, and is sponsored in the United States by the World Wildlife Federation. The program is made up of seven steps, incorporating eight environmental pathways. Once a school has registered and implemented these seven steps, it can apply for an Eco-Schools award. Eco-Schools provides guidelines and a number of useful resources for anyone visiting the website, including worksheets for a school energy audit.¹¹

MAEOE’s Green School Awards program utilizes a model that has been successfully employed by schools throughout the state of Maryland. Close to 400 schools have received green certification since the program began in 1999.¹² According to MAEOE, the five parts of a successful school-based environmental education program are:

- Integration of environmental issues in instruction
- Professional development
- Implementation of best management practices in conservation (BMPs)
- Sustained school-community partnerships to enhance environmental learning
- Celebration of efforts and successes

Schools that show activity within all of these categories can earn the MAEOE Green School Award and become eligible for various incentives.

As this report makes clear, many activities that fall under the above categories are already taking place in our own local schools. Adopting a program like MAEOE’s “Green School Awards” may be a cost-effective way to help ensure that our local efforts develop in a robust and balanced way that is informed by best practices in the environmental education world. We find that the MAEOE framework maps well onto local efforts and use it to guide the following review of a few of the challenges schools face and to make some recommendations for how to move forward.

Green Teams

Environmental education takes root in schools that create and sustain some form of leadership team, often called “Green Teams,” with participation from teachers, school and district administrators, custodians, students, parents and local partner organizations. Green Teams offer a forum where all the different members of a school come together to share ideas and information, discuss challenges, make recommendations, work on solutions, and collaborate on implementation. Green Teams can be instrumental in helping to address the on-going challenge of ensuring consistent communication among staff, teachers, and parents. These teams can also determine ways of consistently recognizing and celebrating achievements.

¹¹<http://www.nwf.org/Global-Warming/School-Solutions/Eco-Schools-USA/Become-an-Eco-School.aspx>

¹²<http://www.maeoe.org/greenschools/application/index.php>

Effective Green Teams set clear short- and long-term goals. Many start with a survey to determine existing environmental projects, needs and opportunities. Schools can benchmark consumption through an audit of the school's operations, especially energy, waste and procurement. There are a number of audit templates easily available to schools on-line. As mentioned, one such audit is available through Eco-Schools, USA.¹³

Many schools in Rockland have already established leadership teams, such as Building Leadership Teams, that are incorporated greening goals. A few schools now have formal 'green teams' made up of teachers and students. These teams have, thus far, tended to focus on recycling efforts in the school.

Integration of Environmental Education into Curriculum

Teachers today face the very real challenges of limited time in the classroom and growing expectations on content coverage and alignment with standardized exams. With a limited number of class periods in the semester, teachers are hesitant to take time to integrate environmental inquiry-driven experiences, indoors or outdoors, into a densely packed curriculum. Teachers and parents who do take time to get involved in greening initiatives and afterschool clubs are challenged to find ways of balancing work or home responsibilities with their efforts in the schools.

Those who are successfully implementing environmental education in their schools are not immune to these pressures. However, they have experienced the benefits and rewards of their efforts and witnessed how engaging environmental curriculum not only prepares students to meet standard academic performance standards, but fosters an enthusiasm for learning and provides them with the skills for meeting real world challenges. Their confidence allows them to view experiential learning not as an added piece, but as an important and integral part of the curriculum.

State and National Support for Environmental Literacy

Getting more teachers into this comfort zone will require a clear state mandate for environmental literacy, such as exists in Maryland, California, Massachusetts and other states, along with the curriculum and training to support this goal, and, of course, a Green Team to facilitate adaptation and implementation in particular schools. New York State does not have mandated environmental literacy standards. There are, however, two bills in the NY State Assembly specifically related to environmental education. One requires that the course of instruction for students in grades kindergarten through twelve include a component on environmental education, including recycling, energy efficiency, conservation, and climate change. The other bill establishes the New York state environmental sustainability education act, which instructs the Department of Education, in conjunction with the Department of Environmental Conservation, to establish a model program to guide the development, implementation, and evaluation of a comprehensive environmental sustainability education program to be made available to public schools. Both of these bills were reintroduced in 2011 and referred to committee.

The New York State Outdoor and Environmental Association (NYSOEA) recently formed an Environmental Literacy Committee consisting of over 30 members across the state. The Committee has drafted an Environmental Literacy Plan for New York State that offers a framework for enhancing education in schools, both through formal and in partnership with non-formal educators. The plan sets out a number of goals, among them: the creation of a database to support information exchange, and the development of pre-service teacher, in-service teacher, and non-formal educator professional

¹³ <http://www.nwf.org/Global-Warming/School-Solutions/Eco-Schools-USA/Become-an-Eco-School/Steps/Environmental-Audit.aspx>

development opportunities using the North American Association of Environmental Education (NAAEE) Guidelines for Excellence while identifying environmental education strands within the K-12 New York State Learning Standards.

New York's Environmental Literacy Committee reflects a growing movement at the state and national level to support environmental education in our schools. This movement is reflected in the growth of national organizations that promote and support environmental literacy, such as the North American Association for Environmental Education (NAAEE) and the U.S. Partnership for Education for Sustainable Development, as well. It can be seen in the development of the No Child Left Inside Act, which now has the support of a number of states and Congressional leaders. This Act would Amend the Elementary and Secondary Education Act of 1965 (No Child Left Behind) to require states, as a prerequisite to receiving implementation grants, to develop environmental literacy plans, approved by the Secretary of Education, for pre-kindergarten through grade 12, that include environmental education standards and teacher training.

There is more evidence that the environmental education movement is gaining ground in the United States. For instance, the American Recovery and Reinvestment Act of 2009, and the 2011 Reauthorization of the Elementary and Secondary Education Act¹⁴ provide competitive grants to states, high-need districts, and nonprofit partners to strengthen the teaching and learning of environmental education, among other subjects. The 2010 Sustainability Summit and the America's Great Outdoors (AGO) Initiative both reflect the growth of federal support for advancing awareness and understanding of our connection to nature and the importance of place-based, experiential learning. As previously noted, the recent formation of the Green Ribbon Schools program, to be administered by the Education Department with the support of the White House Council on Environmental Quality and the U.S. Environmental Protection Agency, is more clear evidence of the growing priority that is being placed on environmental literacy. In the words of U.S. Secretary of Education Arne Duncan, "Preparing our children to be good environmental citizens is some of the most important work any of us can do."¹⁵

Support for Outdoor Learning

The simple fact that suburban schools are surrounded by trees and other natural features is a huge advantage for environmental educators in Rockland County, however, teachers, parents, and even students, are often uncomfortable with exploring nature - they can be squeamish about touching worms, feel pestered by insects, or hesitant to get their hands dirty or get wet. Because many people cannot identify poison ivy, they are, quite reasonably, afraid of touching plants in the wild. Experienced fellow teachers, parents or individuals from local community organizations have helped teachers take the first steps. For example, Master Gardeners from Cornell Cooperative Extension will come out to help teachers in the garden. Parents who are professionals employed by the EPA, DEC, or Columbia University's Lamont-Doherty Earth Observatory have worked with students inside and outside the classroom. Class parents are also much more likely to be open to letting their children experience these engaging lessons if teachers and administrators fully communicate their academic benefits.

¹⁴ http://www2.ed.gov/policy/elsec/leg/blueprint/publication_pg7.html

¹⁵ <http://www.ed.gov/news/press-releases/departments-education-starts-award-green-schools>

Providing Professional Development

One of the best strategies for boosting environmental education is to give teachers the opportunity to work together to re-design curriculum to incorporate environmental knowledge and practices not just in science, but in other subjects as well, and at every grade level. Such professional development workshops are taking place in both southern and northern Westchester, where regional BOCES and component districts are partnering with national experts, such as the Cloud Institute and Creative Change Educational Resources, to provide training for sustainability education. Here in Rockland, BOCES has offered professional development workshops on energy conservation and alternative energy. However, these are not currently offered due to a history of very low enrollment.

There are a number of other opportunities for professional development in our region. These include free to low cost conferences and workshops provided, for example, by: Teaching the Hudson Valley; New York State Outdoor Education Association; Children's Environmental Literacy Foundation; Garrison Institute; Center for Environmental Research and Conservation; Cornell Cooperative Extension, and Green Chimneys. Keep Rockland Beautiful organizes an annual Rockland Environmental Education Symposium that brings teachers, PTA leaders and nonprofit environmental educators together for a day dedicated to sharing best practices and addressing common challenges. Teachers participate in practical workshops on curriculum-based outdoor learning, recycling, gardening, healthy fundraising, Green Team building, and other topics. District Superintendents' Days also represent an opportunity to incorporate workshops on school greening and education for sustainability.

These conferences and workshops are valuable resources for professional development, providing teachers with networking opportunities, curriculum, and training. There are a number of independent environmental educators who are also available to provide workshops or work with individual teachers in their own classrooms. Mentoring among fellow teachers is also a valuable form of professional development. Teachers benefit from systems that support consultation/mentoring with experienced and motivated teachers and principals from within their own, or neighboring districts.

Utilizing Resources

There are a growing number of sources for acquiring lesson plans and curriculum materials. However, with limitations on time and unfamiliarity with the vast pool of resources, teachers are often left feeling overwhelmed. Schools and districts can help by making recommendations at meetings or posting them on-line. The Health and Wellness Coalition often sends out announcements of available programs and grants relating to farms and gardens.

With funding an increasingly difficult issue in our schools, it is encouraging to note that there are a number of sources that can help finance the acquisition of needed resources. Many organizations provide small grants that can help with classroom supplies, garden materials or field trips. Several organizations run contests where teachers are awarded educational trips or funding for curriculum development. The PTA is an important source of funding for any number of projects from environmental awareness programs and events to fieldtrips or infrastructure improvements in the garden. Funding is also available through BOCES for environmental programs and events that qualify for a state-funded CoSer reimbursement. Schools can also benefit from grants from local foundations. Districts are also in a unique position to share grants opportunities, write grants, and foster relationships that will result in financial or in-kind support.

Facilities Greening

Best management practices in school greening are reflected not only in the operation, design, and maintenance of the school building and grounds, but in the degree to which students are involved in sustainable practices. Hands-on use of these green facilities by students and teachers, however, tends to be intermittent – highlighting a common experience with green facilities, i.e. that their installation, however challenging, does not necessarily result in their incorporation into the curriculum. A strong school Green Team can help with coordination and oversight of greening initiatives and practices. Professional development, as mentioned above, can also help teachers integrate green facilities into the curriculum, even to the point of leading “field trips” to the boiler room to learn about energy and involving students in auditing the waste stream and encouraging the behavioral changes required for conserving energy and preventing waste.

School gardens are popular forms of school greening that provide rich contexts for learning. They also present a unique set of challenges. First and foremost is the challenge of getting students out into the garden and integrating this experiential learning into classroom lessons. While garden activities are increasingly being aligned with classroom learning, they are still primarily extracurricular projects of the PTA or a dedicated teacher/gardener who may advise an after school gardening club. The next challenge is the care and maintenance of the garden both during the school year and in the summer months. In the elementary schools, gardens are typically managed and cared for by parent volunteers. These devoted individuals spend untold hours tending the garden, grappling with the challenges of accessing water or acquiring mulch, working with custodial staff, and communicating with other volunteers. If the first challenge were resolved, so in part would be the second. If students were to see their planting through, from seed to harvest, much of the care and maintenance that typically falls on parent volunteers would be taken care of by the students themselves.

Even with active student and teacher involvement during the school year, there is still the challenge of maintaining the garden over the summer. A number of schools have been successful in organizing a system, such as parent or teacher Adopt-A-Week schedule, for summertime watering and care. Another option is to just focus on spring vegetables that can be grown, harvested and eaten before school gets out for the summer. Cornell Cooperative Extension leads these efforts with its “Seed to Salad” program in local schools. Another approach is to build a “community garden” rather than a “school garden” so that students have access not only to a garden, but to the community of neighbors as well. Such a garden was created recently at the Haverstraw Community Center, in close proximity to Haverstraw Middle School and the elementary school. Partnerships with community organizations, neighbors, businesses and nonprofit organizations are a core element of the MAEOE framework and a critical element to the success of environmental education in schools.

Celebration

Taking time to celebrate the environment and showcase environmental education activities and projects is critical to creating a school culture that supports environmental education. A little acknowledgement and praise goes a long way. Principals, other administrators, and board members can acknowledge and celebrate these efforts in a variety of ways, from sharing them at school assemblies or school board meetings to publishing them in school newsletters or on school and district websites. Using green facilities, such as gardens, outdoor classrooms or nature trails as venues for meetings, photo ops, and other events or ceremonies can really help build appreciation and acceptance for environmental education.

School-Community Partnerships

Partnerships bring in resources, whether it is a local landscaper helping to install a garden, a Scout troop building an outdoor classroom, a nonprofit like KRB bringing the “Energy Bike” and other specialized equipment for an Earth Day event, or a larger business that invests both money and employee labor in local projects. Partnerships are also important for the opportunities they create for students and teachers to get students out into the community, complete community service requirements and work with real world issues and challenges. Grants for environmental education often explicitly require or reward school-community partnerships because donors know that projects with multiple stakeholders are more likely to become sustainable and have an enduring impact.

Organizations like Keep Rockland Beautiful, with its network of professional relations among local business, government and nonprofits, can help schools find the support they need in the community and help facilitate these partnerships. The current status of networking among local environmental educators is quite loose. In many cases, school-community partnerships are based on volunteerism, with students looking to local environmental organizations for help completing community service “hours” required for graduation or honor society, and members of the broader community volunteering to improve school grounds, read to kids, and act as ‘guest experts.’ More systematic planning and coordination of volunteerism in the environmental sector locally would yield multiple benefits for all involved, as well as the environment itself, and would be aided immensely by the formation of a more formal network of environmental educators.

Going forward, Rockland County would benefit from the formation of an actual association of environmental and outdoor educators – teachers, nonprofit professionals, local business people and others – that would tighten the lines of communication among like-minded educators and enable schools to more easily identify community partners, as well as grant opportunities, field trip ideas and other supports for environmental education. The hypothetical “Rockland Association of Environmental and Outdoor Educators” would be a member of the North American Association of Environmental Educators (NAAEE) and the New York State Outdoor Environmental Education Association (NYSOEA), participate in current efforts to update NYS educational standards with environmental literacy, and could help run a local Green Schools Awards program, as well.

Moving Forward

It is an exciting time to be doing environmental education. We are a part of a growing movement that recognizes the value of environmental education in preparing our students to meet academic performance standards, and of cultivating our students’ understanding of their environment to enable them to meet the challenges of the future. If we are to prepare our young to be environmentally literate citizens, we will need to provide the needed resources, encouragement, and support to sustain the growth and enrichment of environmental education programs and practices. This begins with a strategic and systematic approach that sets and returns to goals and finds ways of consistently building upon experience. Our challenge is to build a strong administrative framework of guidance and support from the top down that is met by initiative, enthusiasm, and commitment from parents, educators, and staff from the ground up.

Part II: Highlights of Environmental Education in Rockland County Schools



Curriculum-based Environmental Education Inside and Outside the Classroom

A. MacArthur Barr Middle School, Nanuet Union Free School District



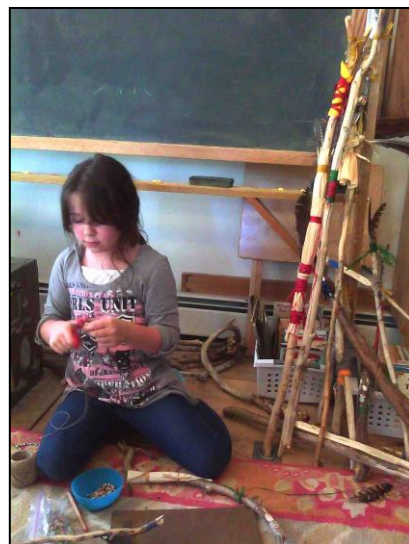
Sixth grade classes at A. MacArthur Barr have been participating in Trout Unlimited's "Trout in the Classroom" program for the past several years. Classes receive eggs in October, watch them hatch and then release them into the Mahwah River in Kakiat Park in May. This project, which is tied to science lessons focused on the health of the ecosystem, is spearheaded by teachers Debi Levy and Heather Schucker. However, it is very much a collaborative effort involving Trout Unlimited and Rockland County Parks, with the active participation of the school's principal

and several other teachers. In 2011, Nanuet Senior High School students and their Environmental Science teacher, Charles Barone, assisted with the day's activities. These included the trout release, macroinvertebrate discovery and observation, GPS positioning, and hiking. Environmental educator Roy Hurd led activities on predator-prey relationships and survival skills. A. MacArthur Barr teachers, Cathy Marczyk and Michael Kronberg, led a music station with their guitars and got students thinking creatively as they wrote songs that dealt with protecting the environment and bully prevention. The sixth grade classes also invited children from Miller Elementary School into their classrooms to observe and learn about the trout and the health of aquatic ecosystems.

Viola Elementary School in the Ramapo Central School District also participates in this Trout Unlimited project.

Blue Rock School of West Nyack

In 2011, Blue Rock, a private, secular school in West Nyack, completed a special project entitled "Making Art from the Landscape: Indigenous Art and Indigenous People." The project was conceived and led by environmental educator and artist Brooke Smokelin and facilitated by Blue Rock School Art Teacher Eileen Leith, who worked together with the school's second and third graders. Ms. Smokelin's goal with this special project was to engage children in an artistic and environmental exploration of different cultures and landscapes, (including their own), in order to gain an understanding of how the natural environment influences the artistic expressions of the people that live within it. After studying the art and landscapes of the various indigenous peoples, students used natural materials that they collected from the Hudson River banks and their own wooded school grounds in various forms of artistic expression—from medicine bags to prayer sticks and corn husk dolls. Students also devised a language of symbols to tell their own stories about the features of their landscape which they displayed on some of their artwork. The project culminated with a school-wide celebration in the woods hosted by the second and third graders. Project artwork and photos were also exhibited at the inaugural Clarkstown Environmental Summit at Clarkstown High School South on March 5, 2011.



BOCES CTEC

Career and Technology students on the BOCES West Nyack campus engage in hands-on learning by observing and working with rooftop solar panel arrays and garden and a wind turbine. At the student-built house, they learn about the design and maintenance of photovoltaic shingles, a geothermal heating and cooling system, and gray water piping. Automotive classes are learning about fuel efficient, hybrid cars and students in the Culinary Arts program contribute cooking grease to be used as biodiesel in several buses in the BOCES fleet. In 2011, students in the electronics class worked with students in graphics and carpentry to design and build a pedal-powered energy bike and display for Keep Rockland Beautiful's Earth B.E.A.T. program.



Cottage Lane Elementary School, Orangetown Central School District

Fourth grade classes at Cottage Lane have engaged in meaningful lessons about the human/environment connection with the help of teachers Jacob Tanenbaum and Kottie-Christie-Blick. Mr. Tanenbaum, the school's Technology Teacher, has participated in the NOAA Teacher at Sea program three times since 2006. In 2007, he and Ms. Anne O'Brien's 4th grade students, assisted by scientists from Columbia University's Lamont Doherty Earth Observatory, designed and built a drifter buoy that was able to report its location and the surrounding water

temperature. The students took a field trip to the Hudson River to test the buoy before it was released into the Bering Sea from a NOAA Research Vessel. To tie their observations to an understanding of the issues around climate change, students researched books and Internet sites and viewed segments of the film *An Inconvenient Truth*. They also wrote an article about what they learned about the topic as part of their non-fiction unit. In 2010-2011, students monitored a different drifter that Mr. Tanenbaum released in the North Atlantic off the coast of Massachusetts. In 2009, during their unit on ecosystems, Mr. Tanenbaum helped Ms. Kottie Christie-Blick's fourth grade class connect with students on the other side of the globe to share learning about ocean pollution and taking care of the environment. They communicated weekly via computer with a class in South Korea sharing their discoveries, such as, if you drop a piece of trash on the streets of Rockland County, it can be washed down a storm drain in the next rain and end up in the ocean. They were also able to hold a live class via Skype to share their scientific experiments with their Korean friends. They shared their scientific discoveries with their peers, then used their findings to support arguments for social change made in letters to legislators.



Highview Elementary School, Nanuet Union Free School District

Third and fourth grade students at Highview Elementary School connect to reading, writing, and mathematics through outdoor experiences in the school's Landscape for Learning. This nature path, first conceived by Highview students as a way of connecting to literature, was a collaborative effort between teachers, students, an Eagle Scout and his troop. The project also received financial support from the Nanuet Rotary and district. Nancy Bonner and Anna Sexton, two of Highview's teachers,

worked to develop lessons that integrated the students' observations and experiences outdoors into their curriculum. The lessons focused on using the environment to hone the skills of observation, data collection, measurement, illustration, and writing. For example, "A Walk in the Woods" is an activity in which students are asked to detect signs of animal life, observe, collect data, make illustrations, and take notes. "Adopt A Tree", "Be a Soil Investigator", and "Enviroscape" are other activities in which students are asked to record observations, take measurements, and record changes that occur from fall to spring.

Pearl River High School, Pearl River Central School District

For the past eight years, Tom Mullane and Sheryl Palacio, two science teachers at Pearl River High School, have participated with their AP Environmental Science students in an experiential program sponsored by the DEC's Hudson River Estuary Program in partnership with the Lamont-Doherty Earth Observatory of Columbia University. Each fall, Pearl River's classes, join other school groups all along the Hudson River estuary, in collecting scientific information and sharing it to create a picture of *A Day in the Life of the Hudson River*. Using hands-on field techniques, they describe their sites, monitor the physical river system, seine for fish, collect water and invertebrate samples, and examine water chemistry parameters. They then use this data to understand how their piece of the river fits into the large and complex Hudson estuary ecosystem.



A number of other schools in the county participate in this annual program, including: Nyack Middle School; Nyack High School; Upper Nyack Elementary; Tappan Zee High School; North Rockland High School; Clarkstown South High School; and Blue Rock School.



For the last three years, Tom & Sheryl's students participated in another rich outdoor learning experience that allowed them to explore the river from multiple perspectives. They used all their senses to enrich their writing as they traveled along the river to Nyack Beach, Bear Mountain, Boscobel, and Cold Spring. This interdisciplinary project was part of a combined Science and English unit developed cooperatively by the Sheryl, Tom, and Eileen Shepard, an A.P. English Literature teacher. Tom was inspired to develop this learning experience after taking part in River Summer, a unique professional development program that takes place right on the Hudson River. This

multi-institutional field program uses the Hudson River as an extended laboratory and classroom to investigate the development of the watershed within an interdisciplinary framework. Tom also worked with the Cary Institute of Ecosystem Studies in their Data Explorations in Ecology Project (DEEP) Fellowship. Both of these rich professional development experiences have directly influenced the quality of the educational experience of students at PRHS.

Sloatsburg Elementary School, Ramapo Central School District

In 2010 – 2011, fifth-grade students at Sloatsburg Elementary School participated in an exciting new STEM unit on the Living Environment that focused on water quality and the health of the ecosystem in a small Kansas community. Students took on the roles of advisors charged with the critical task of determining whether or not to approve the opening of a new industrial factory in a rural town where the local river played a large role in the economy and in the lives of local residents. Throughout the unit, students employed the professional skills and practices



of ecologists as they learned about ecosystems, living organisms, water quality, and the various effects of human-environment interaction. These engaging, inquiry-driven lessons came out of “Living Together”, a project-based unit developed by It's About Time, Herff Jones Education Division, a Westchester company that specializes in developing math and science programs. In addition to completing numerous classroom projects and experiments, students traveled to the nearby Ramapo River to engage in authentic hands-on learning. During their environmental education field trip, students worked in teams to collect important information and conduct various tests regarding the quality of the river water.



Spring Valley High School, East Ramapo Central School District

Environmental Science and Participation in Government classes at Spring Valley High School have been participating in Rockland P.L.U.S. (Planning Land Use with Students) since the program first began in 2005. Students examine local land use issues and explore integrated avenues to creating a healthy, sustainable community. A local case study serves as a lens for looking at the broader implications –both environmental and social – of local land policies. Rockland P.L.U.S. begins with classroom

workshops and culminates in a full day symposium that brings students together to work in small collaborative groups under the guidance of professional mentors from fields including planning, engineering, real estate, and environmental law. Together they envision and map out a sustainable plan for a local redevelopment site. Students must consider the needs, desires, and concerns of the different stakeholders in the community, while addressing the many interdependent issues associated with development - everything from the planning process itself to watershed, habitat, affordable housing, and employment issues. Rockland P.L.U.S. is a partnership between Keep Rockland Beautiful, Columbia University Lamont-Doherty Earth Observatory, Cornell University Cooperative Extension, and Rockland County AmeriCorps. *All of Rockland's high schools have participated in Rockland P.L.U.S., at one time or another, since the program first began in 2005. North Rockland, Pearl River, Ramapo, Spring Valley, and Suffern High Schools participated for six consecutive years.*



Suffern High School – Ramapo Central School District

In Suffern High School's Sustainable Energy course, students learn about the different sources of energy that are used today and explore the technologies of green alternative energy sources, such as solar, wind, tides, hydroelectric, ocean currents, geothermal, and biomass. The efficiency of conventional building

practices is compared to green construction technology such as LEED, hay bale, and geodesic construction. Students learn about Ecological Footprints and use energy audits and computer models to compare and contrast building efficiencies and help explain the need for green technology. Each year, the class is taken on a tour of the BOCES Career & Technical Education Center, where they learn about several green technology initiatives implemented on the West Nyack campus. The tour includes the 40-foot-tall small wind turbine student house built as an on-site "green technologies lab."

Upper Nyack Elementary School, Nyack Central School District

At Upper Nyack Elementary School, teachers partner with science and environmental organizations and the PTA to create interactive lessons that show kids how science can be interesting, fun, and pertinent to their lives. For example, second graders participate in an Aquatic Macroinvertebrate Leaf Pack Study as part of their Insect Science Unit. The study takes the classes to the "field" - the local park - where educators and scientists work with the children to make leaf packs that are then placed in local streams in order to attract aquatic insects. The leaf packs are removed from the streams three weeks later and brought into the classroom for observation. The children use microscopes to help them identify the insects, and learn how the species help indicate water quality in their local streams. In the early fall, as part of their Water Cycle Science Unit, the third graders participate in *A Day in the Life of the Hudson River* (See highlight on Pearl River High School). The school's fifth graders take a walking trip every fall to Nyack Beach State Park to participate in a river seining exercise with an educator from the Hudson River Foundation and learn about the river ecosystem as part of their science unit.



Energy Conservation, Waste Reduction and Recycling

A. MacArthur Barr Middle School, Nanuet Union Free School District



C.A.R.E. (Creative Awareness for Recycling & the Environment) is an active club that has benefitted over the past several years from the support of two teacher/advisors, Cathy Marczyk and Heather Schucker. For the past several years, C.A.R.E. students have been monitoring recycling, helping to clean and package recyclables for cash programs and making morning announcements to encourage greening in the school. They also helped to monitor energy use, and turned off lights and computers at the end of day. In 2007, the school adopted the Go Green Initiative, a comprehensive environmental program that teaches earth-friendly behaviors and helps participants to evaluate school activities. That year, the club helped with a school-wide assembly to kick off their recycling program. Students also incorporated the research they had done on practical ways to become a greener school into a PowerPoint program that they presented to the Board of Education. This presentation led the entire district to switch from Styrofoam to biodegradable/compostable paper lunch trays. C.A.R.E. is planning the 2011-2012 with a new focus on the school's courtyard garden. In 2010 - 2011, students did research on vegetables, and with approval from the administration and funding from the PTA, were able to buy all of the needed materials for their first raised-bed garden frame. Principal Roger Guccione added his carpentry expertise, his tools and several hours of labor to build the frame. Plans are in place to start growing vegetables that will be added to the school lunch salad bar.

Congers Elementary School, Clarkstown Central School District

Congers Elementary School Kids F.A.C.E. (Kids for a Clean Environment) is an active school club aided by three dedicated teacher/advisors, Barbara Mihalcz, Holly Dickerson and Lisa Roy. The club promotes recycling efforts in the school and the Congers community. Students provide weekly environmental messages for morning announcements and operate a recycling bin monitor squad. The club collects and recycles plastic, metal, and paper in receptacles they received from a NYSERDA grant. Students design, create and model 'recycled' clothing and accessories in a fashion show during their Earth Day Assembly each April. They also have painted trashcans through the Keep Rockland Beautiful Artful Receptacles project. As young conservationists, they encourage families in the community to participate annually in Earth Hour, an international event that calls attention to the power of simple energy saving measures. In 2010, Congers Kids F.A.C.E. received national acclaim as they teamed with students from Clarkstown North High School to enter America's Greenest School contest. Together they wrote, filmed, and edited a video to promote school bus ridership. Their video was selected as a top 10 finalist from 550 entries from schools across the nation. Kids F.A.C.E. members took advantage of this opportunity to speak about environmental awareness in local and national television and radio programs and in newspaper articles.





Fieldstone Secondary School, North Rockland Central School District

The Environmental Club at Fieldstone Secondary School was first inspired by student participation in the 2007 Great American Cleanup (GAC). The club now has an impressive list of projects they have helped to initiate and maintain. These include participation in the GAC each year and planting over 150 trees and numerous bulbs around the school grounds and in the school garden. The Club's members have also helped develop the Nature Trail along the Minisceongo Creek, taken field trips to a variety of environmental events, and helped out with

the Rockland Environmental Education Symposium (R.E.E.S.), an annual event hosted by the Fieldstone Secondary School and Keep Rockland Beautiful. The Club also assisted with the school's initial recycling efforts. Over the last five years, these efforts have evolved to include routine paper and plastic container collection. Recycling Teams oversee a program that has virtually school-wide participation. Every Thursday, representatives from every class bring all recyclables to a collection station staffed by Team members. The entire school is done in twenty minutes. The Environmental Club's popularity inspired the formation of a similar club at North Rockland High School, and alumni sometimes return to Fieldstone to participate in Club activities. One very conscientious and creative alumnus created an inspiring video that was used in the opening session of the R.E.E.S. 2011.

<http://www.youtube.com/watch?v=D0ozSqyvde0>

Stony Point Elementary School, North Rockland Central School District

Stony Point Elementary has been working diligently to 'go green'. In addition to a school-wide recycling program for paper and plastics, they have added three brigades to work with their new Terracycle Program, which generates cash for collected juice pouches, plastic baggies, and potato chip bags. Volunteer student monitors watch over recycling bins during lunch periods to ensure proper disposal procedures are being followed. All students are encouraged to save items from their snacks and bring them down to designated areas. Recycling teams also sort through the paper and plastic that has been collected from the classrooms on a weekly basis. All water bottles are emptied, counted, and brought down to the beverage center to retrieve the deposit money. All Terracycle products are counted, boxed, and shipped off to earn money for each item returned. The school's Earth B.E.A.T. event included a display of projects - games, bird feeders, purses - that the students made from recycled materials. Students who participated in the school's recycling efforts were included in a raffle of Terracycle products. The school's Physical Education Teachers, Noreen Apicella and Tom Nelsen, and Head Custodian, Peter Onderdonk, are instrumental in the success of Stony Point's greening efforts.





Suffern Middle School, Ramapo Central School District

Suffern Middle School started 2011 with the district's first comprehensive recycling program. Fifty students from all three grades, along with their Green Team advisors, Julia Jaffee, Gina Parisi, and Elio Ficarella, participated in an effort to collect paper and container recyclables from classrooms and the cafeteria. The initiative, which was inspired by SMS' successful Earth B.E.A.T. event, began with help of the PTA and a grant from the REACH Foundation of Rockland. The SMS Green Team set up a system in which students sort through cans and bottles to get refunds that are pooled in a fund for the team. In the month of March alone, the team sent 50 full bags of bottles/cans to be recycled. A portion of the funds went toward prizes for a lunchtime raffle that included iTunes cards and other sought after prizes. Local businesses kicked in and gave gift certificates for raffles and prizes. How did students obtain a raffle ticket? By recycling a bottle or can, of course! Additionally, the team collected about

400 lbs. of paper per week. About 3,000 pounds of paper were recycled in just three months. The school's Green Team has the support of staff, administration and custodians. Green Team advisors also worked closely with the Rockland County Solid Waste Management Authority and their Solid Waste Educators to get the program up and running. The team has the support of others in the student body as well. The Greek Counsel hosted a very successful GREEN dance to support the program in April. Sixth grade students wrote and performed songs about recycling, and students across the building helped to promote and celebrate the school's successes by creating and posting digital art, graphs and charts throughout the building. Suffern Middle School was the recipient of a 2011 Rockland Recycles Award.

Gardens and Farm-to-School Connections

BOCES



Career and Technical Education

In the 2009 – 2010 school year, occupational science and math students in the BOCES CTEC program worked on an interdisciplinary collaborative green roof project. Ms. Fanny Perez-Michaud, CTEC's occupational science teacher, designed an experiment that allowed students to research the feasibility and benefits of a green roof. They investigated which soils and plants might be best suited for rooftop growing, then monitored conditions and growth rates of plants in three different beds to determine the most suitable growing medium for the school's weather conditions. The students

also worked on a rooftop garden at Union Restaurant in Haverstraw where their produce supplied a local community kitchen. In 2010, Fanny Perez-Michaud was named PBS Teachers Innovator for this project.

Jesse J. Kaplan School

In 2010, students at the Jesse J. Kaplan School participated in the unique Pickle Power Project that had students from across the West Nyack BOCES campus putting their knowledge and skills into action from 'seed-to-salad'. Kaplan students germinated cucumber seeds in their temporary Green/Hothouse, which was built by CTEC carpentry and plumbing students. Later, students from the Work Based Learning Center were on hand to help the Kaplan students plant their seedlings in the schoolyard garden. The cucumbers were then passed along to CTEC's Culinary students who turned them into pickles.

The pickles were sold to raise funds for Kaplan's PTA, and donated to a local food pantry. Nothing went to waste; the left over salt brine was used for snow/ice melt on campus!



Chestnut Ridge Middle School, East Ramapo Central School District

At Chestnut Ridge Middle School, an Ecological Sanctuary at the center of the school helps students connect with nature. Under the guidance of Maxine Simon, the school's Science Living Environment teacher, the Earth Science Club is learning about local wildlife and how to create a healthy garden in which to produce crops for humans as well as food for the birds, ducks, and turtles. This hands-on wildlife habitat and garden project is helping students to understand the environmental and agricultural concerns of the

21st century and provides a context for teaching nutrition and for encouraging healthy lifestyles. In 2010, students began the work of transforming their interior courtyard into a vibrant habitat, complete with a pond and Chestnut tree. During the snowy days of winter, the students created bird feeders, planted in terrariums, and conducted research in the library. In the spring, they tended the garden and shared their harvests with the Community. An invitation to visit the garden was extended to parents and other Community members. The students, teachers, and parents of the Earth Science Club at Chestnut Ridge believe that gardening and learning in nature help children grow — mentally, emotionally, and physically. They hope the Ecological Sanctuary will become the centerpiece of the school where all teachers can take advantage of the many opportunities for hands-on learning in subjects across the curriculum.



Franklin Avenue Elementary School, Pearl River Central School District

Third and fourth grade students in Franklin Avenue's after school Garden Club have benefited from having two knowledgeable advisors to guide and support their work in the school's garden. Fourth grade teacher, Janet Fenton, is also a Master Gardener with Cornell University Cooperative Extension's School Garden Network, and Jean Willock is the school's nurse. A pizza garden was recently added to the array of flowers, vegetables, and herbs that are tended to by students and PTA parents. In 2011, their harvest yielded 55 pounds of fresh produce that went to St. Ann's Church for distribution to a food network. The school recycles the organic cafeteria waste in Earth Machine compost bins donated by Cornell Cooperative Extension of Rockland. The bins and the vermicomposting of classroom snack waste are maintained by Mrs. Fenton's class. The compost is then used in the courtyard vegetable garden beds to enrich the soil.

Haverstraw Middle School, North Rockland Central School District

Haverstraw Middle School students are involved in a new community/school garden that opened in the spring of 2010. The Haverstraw Community Garden is located on the property of the Haverstraw Middle School between the school and the Haverstraw Community Center. The garden was developed through the collaborative efforts of the Village of Haverstraw, North Rockland Central School District, Rockland County Department of Health, Cornell Cooperative Extension, and the North Rockland Garden Consortium. It allows for over 20 families to rent plots seasonally and provides approximately 30 plots for students and school use. Haverstraw Middle School teachers have started seeds in their classrooms and dedicated Saturdays to transplanting their seedlings into the ground. Students, CCE Master Gardeners, and community center volunteers are working collaboratively to care for and maintain the garden plots in conjunction with an intergenerational initiative with the Village's senior program. Students gained community services hours by helping to harvest over 250 lbs. of fresh produce that was provided to local food pantries.



Hillcrest Elementary School, East Ramapo Central School District

When Cornell Cooperative Extension Master Gardeners visited Hillcrest in March 2010, over 33 students, grades 4-6, came to learn about how to get their school garden started. The school began preparations for its Seed to Salad School Garden by forming committees consisting of two students from each class. These committees were responsible for helping to plan for spring plantings. At the garden's "Kick Off" in May, most students participated in a small classroom garden project to entice them to apply to become a Student Master Gardener. To do so, they would need to write an essay about why they wanted to be involved, fill out an application, and obtain a recommendation from a staff member and a parent. The first order of business for these Junior Master Gardeners was to coordinate the naming of the garden. They then gave up their recess periods to attend workshops to learn about gardening. The students then planted

lettuce, a variety of beans, snow peas and some tomatoes and coordinated, fertilizing and watering the garden. These students took what they learned through their gardening experience during the spring and brought it back to their classrooms. At harvest time, the Junior Master Gardeners cut the vegetables, bagged and washed them. They then served their fresh garden salad to the whole school during their lunch periods. Hillcrest's School Nurse, Sally Kagan, Custodian, Robert Paladino, and Joanne Robinson—Silas, Family Resource Coordinator, all worked on this program with the support of Hillcrest's Principal, Mrs. Jennifer Wilmoth. The school is now being rented to a private school. However, Joanne is currently working with Cornell Cooperative Extension and a staff member to bring a garden program to Kakiat school.

Lincoln Avenue Elementary School, Pearl River Central School District

As a result of a grant from the Westchester Rockland Veterinary Medical Association, Cornell Cooperative Extension's 4-H Youth Development program held the first Farm to School Program at the Lincoln Avenue Elementary School in June of 2010. The goals of the program included providing youth with a greater understanding of how their food is grown, introducing them to farm animals and the products they provide for humans, encouraging them to eat fresh fruits and vegetables, and inspiring them to protect and

preserve their environment. A total of 285 children in grades kindergarten through fourth grade visited the "farm", where they: met a dairy calf to learn about milk production and a miniature horse to learn about the role horses have played in agriculture; a beekeeper who emphasized the importance of pollinators in the environment; a backyard "farmer" who taught them about chickens and egg production; a CCE Master Gardener who taught them about soil science through a worm composting demonstration; and a Rockland County Public Health Educator who invited them to visit the Farmer's Market to learn about the importance of eating fresh fruits and vegetables. Lincoln Avenue teachers and administrators worked with the 4-H program coordinators to ensure their activity selection for the day augmented the science curriculum by 'bringing to life' many of the concepts the children had learned throughout the school year.



Link Elementary School, Clarkstown Central School District

In June of 2011, seventy-five first grade students walked down the street to Cropsey Community Farm, a five-acre organic vegetable farm in its first season on the former Cropsey Farm property in New City, and Rockland Farm Alliance's first farm project. The students were split up into two groups and each group learned about the different parts of the farm, got a lesson on bees, and planted a row of celery. The students enjoyed a picnic lunch outdoors and sang songs with the farm team and volunteers. Educating the community about small-scale sustainable agriculture is part of Rockland Farm Alliance's mission. Cropsey Community Farm is engaging students of all ages in farm projects. In the fall of 2011, several groups of students have visited the farm, including classes from RCC, Nyack High School Environmental Science classes, and a 4th grade class from the Blue Rock School.



Margetts Elementary School, East Ramapo Central School District

For the past ten years, the East Ramapo Central School District engaged in a partnership with the Pfeiffer Center that had several classes from schools in the district participating each year in The Outdoor Lesson. This year-long, farm-to-school program connects students to the sources of food and bridges learning across the disciplines. In 2010-2011, Ms. Kay and Mrs. Norelli's first grade classes made four trips to Pfeiffer's Duryea Farm where they experienced life on the farm with the change of the seasons. Farmer Carol also visited their classroom

twice during the year. At Duryea, students learned about 18th and 19th century farm life and observed some of the differences between urban, suburban, and rural communities today. On their fall trip, students went into the fields to taste dinosaur kale and harvest red peppers. They also made apple cider with a hand press. During their winter trip, students learned about Native American life and early farm tools. They played a traditional game, made butter, and ground corn into flour. During their first spring trip, they learned about spinning wool from tools used by Native Americans, saw a week old baby calf, visited the greenhouse and planted peas to bring back and plant in the school's courtyard garden.

First and second grade students at Margetts Elementary School are actively involved in their school's courtyard garden. Second grade teacher, Terry Bakke, uses the garden to help teach ELA, Science, Social Studies, and Math. For example, he uses his favorite piece of children's literature about gardening, the Flower Garden by Eve Bunting, to draw students into a beautifully illustrated reading, and into the beauty of gardening. Students, many of whom do not have space for a garden at home, connect to this story of a little girl and her father who plant flowers in a window



box outside their apartment window high above the city streets. After reading the story, the second graders plant many of the same flowers in the school's courtyard garden. In 2010-2011, students learned about the life cycle of a sunflower. Each one planted sunflowers in peat pots that were placed in the school's small greenhouse and later transferred into one of the beds in the courtyard. Through their science curriculum, students followed the life cycle of their plants. They used their math skills to track temperatures and growth in the greenhouse and measured growth outside in the raised beds. They tended their plantings and planned to harvest the sunflower heads and the seeds when they returned in the fall. Margetts students have also been able to grow spring crops of lettuce, radish and carrots for a fresh salad. As is the case with other school gardens in Rockland, a major challenge for the garden plantings is the short spring growing season and maintenance of the garden over the summer.



Nyack High School, Nyack Central School District

The Firth Forth Organic Garden at Nyack High School is under the auspices of Students Opposing Starvation (S.O.S.), a student club advised by teachers, Tom Burns and Deb Alter. The garden is tended by S.O.S. students and utilized in the hands-on curriculum of the school's new Botany and Horticulture and its Environmental Science classes. S.O.S. tends the garden throughout the year, and donates the garden's produce to soup kitchens, such as Nyack's Soup Angels, and to the homeless in NYC through its annual Midnight Run to Manhattan. During the summer months, student volunteers come by to weed, water

and harvest. Nyack students are excited to get their hands dirty and learn about where food comes from. Students from the high school's Botany and Horticulture class also took field trips to Liberty and Valley Cottage Elementary Schools and Nyack Middle School to help younger students make an exciting connection to some of the principles of horticulture by planting seeds of their own.

Ramapo Freshman Center

For eight years, the Ramapo Freshman Center's Courtyard Community Garden engaged Art & Special Education classes, teachers, and staff in collaborative projects that brought the enjoyment of art and nature to the school community. Keep Rockland Beautiful, worked with RFC to help facilitate many of these



courtyard projects that included: designing and painting a mural; planting flowers and shrubs; stocking and maintaining an outdoor pond; creating beautiful bird houses; and restoring the students' award winning trash cans, which they painted every year as part of KRB's Artful Receptacles program. The courtyard was also host to guest speakers, singers, and musicians. In the school's warehouse art classroom, KRB guest speakers came to teach about litter prevention, recycling, and protecting Hudson Valley watersheds. In 2011, RFC became Kakiat Elementary School. Ninth grade students have joined the student body at Ramapo High School. RFC staff and students were



saddened to leave behind their special space. Each year, Colleen Vanderhoef, RFC's Art Teacher, had students plant a single daffodil flower, and, year after year, students would return to see their flowers bloom in the spring. Colleen, now teaching at the high school, hopes to have the opportunity to work once again with students in that school's courtyard garden.



Summit School Summerwork Program at Ramapo High School

In the summer of 2001, Summit School began a partnership with Ramapo High School that has helped in the restoration and maintenance of Ramapo's large interior courtyard garden, and provided an inviting botanical experience to students, faculty and the community. When Keep Rockland Beautiful first facilitated this mutually beneficial project, Summit was asked to provide the manpower and Ramapo the site and tools needed. For six weeks during the months of July and August, twelve students accompanied by Summit Vocational Staff members, Shulton Whitley,

Kyle Hassell, and Sy Samuels, worked in the garden every Tuesday morning. Lynn Garfinkel, a Ramapo High School science teacher and advisor to the school's environmental club, joined them. This began a decade-long partnership that continues today. Each year, a new project has been added to the maintenance program. Projects have included: construction of a marble & limestone patio; restoration of the two fish and duck ponds; restoration of the walking paths; pruning of overgrowth blocking the classroom windows; and the creation of multicolored gravel paths around the ponds. Summit's summer workers have also pruned fig trees, added organic mulch to some of the paths, planted memorial trees and perennials, cultivated grape vines and repotted hosta plants to be used in sales by the Ramapo students. None of this would have been possible without the inspiration and dedication shown by their mentor, Louise Grabell, a now retired member of the staff at Ramapo High School.

Upper Nyack Elementary School, Nyack Central School District

Upper Nyack's gardens are now utilized by grades K – 4. The kindergarten and first grade teachers participate in Cornell Cooperative Extension's Seed-to-Salad program. This program addresses the challenges of integrating garden activities into the curriculum and school schedule. Simple lesson plans are provided to involve teachers and students in everything from planting to harvest. Students plant lettuce, spinach, beans, and radishes in early spring. They harvest just before school lets out for the summer and eat the rewards at a Salad Party. The first grade classes tie their experiences in the garden to lessons in their Plant Science Unit. Third graders at Upper Nyack plant a Native American Three Sisters' Garden - corn, beans and squash - in warm weather at the end of the school year, so when they are in fourth grade they can harvest this fall crop. These activities enhance fourth grade Science units and Social Studies units on early Native American and colonial history and culture. All the grades benefit from an experience that inspires healthy food choices. Upper Nyack is a member of CCE's School Garden Network.





Valley Cottage Elementary School, Nyack Central School District

Valley Cottage Elementary School's large interior courtyard is full of opportunities for outdoor, experiential learning. The courtyard is a Wildlife Habitat certified by the National Wildlife Federation. Over the years, a variety of perennials and shrubs have been planted to attract birds and wildlife that help demonstrate the interdependent relationships in nature. A number of shrubs were acquired through the DEC's free seedling program. Chris Cefola, a local

businessman with a background in marine biology, donates his time and resources to sustaining a pond, complete with waterfall, bog, koi, and turtles. The large greenhouse and six raised beds are used for raising vegetables and flowers from seed to harvest. Over the past few years, there has been a concerted effort to integrate hands-on activities in the garden into science and other curriculum and to develop a supportive framework to sustain the garden. In 2010, the PTA Courtyard Committee joined with the school's Health and Wellness Committee. A binder containing helpful resources and records of prior activities was organized to help guide the courtyard from generation to generation, and the principal incorporated goals for the courtyard garden into the school improvement plan. The Courtyard Committee now includes a teacher liaison who assists with scheduling class plantings. The Family Resource Center has also supported Farm-to-School efforts, for example, by sending a fourth grade teacher to participate in the Stone Barns Center for Food and Agriculture for a workshop on *Growing School Gardens Across the Curriculum*, and by organizing activities to bring in fresh produce for tastings that introduce children to healthier eating. Every grade is now involved in garden activities. Kindergartners plant seeds in the classroom and bring home their flowering plants for Mother's Day. The second grade is participating in CCE's Seed to Salad program. The third grade has a bed dedicated to planting and harvesting peas. The fourth and fifth grade Social Studies classes plant and harvest a "Three Sisters" Garden. As with most school gardens, VCE has struggled with its care and maintenance of the garden and with getting teachers and students to fully utilize this resource. The students do some watering during the school year, but weeding and other maintenance chores have fallen primarily on parent volunteers. During the summer months, the beds are tended by parents who participate in an Adopt-a-Week program. In 2010, one bed was set aside for Girl Scout (GS) Junior Troop #40027, who won their Bronze Award by participating in the Plant a Row for the Hungry Initiative. VCE is a member of CCE School Garden Network .

Other school with gardens include: Cottage Lane Elementary; Fieldstone Secondary School; Gerald Neary Elementary; Little Tor Elementary; Tappan Zee Elementary; Sloatsburg Elementary; William O Schaefer Elementary; Woodglenn Elementary

Enriching Events

Earth B.E.A.T. (Basic Environmental Awareness Training)



A number of elementary schools in the county participate in Keep Rockland Beautiful's Earth B.E.A.T. program. The event provides elementary and middle school students with a fun and engaging learning experience that fosters environmental stewardship. Rotating through a series of interactive "Eco-Stations", students get to know local wildlife and habitats, learn about waste reduction, water, and energy conservation, and leave each activity empowered with a few simple steps toward protecting the environment. A

school's Earth B.E.A.T. program is often part of a larger initiative dedicated to environmental awareness and school greening.



Cottage Lane Elementary School, South Orangetown Central School District

In 2011, Cottage Lane's Second Annual Earth Day Celebration included several Earth B.E.A.T. Eco-Station activities. This special day for the 4th and 5th grades took place at Tallman State Park where students enjoyed the beautiful natural habitat while learning about everything from climate change and rising sea levels to geocaching. The event was a collaborative endeavor by the 4th and 5th grade teachers. It was spearheaded by Jacob Tanenbaum and actively supported by Brian Culot, the school's principal. Several organizations and independent environmental educators volunteered their time that day to facilitate stations.

Evans Park Elementary School, Pearl River Central School District

In 2011, Evans Park hosted a two-day event that included Earth B.E.A.T.'s newest Eco-Station, the Energy Bike – the product of a collaborative partnership between KRB, Orange & Rockland Utilities, and BOCES CTEC students. This calorie burning activity helps demonstrate the amount of energy needed to power compact fluorescent versus incandescent lights bulbs. Earth B.E.A.T. at Evans Park began with a Kick Off that featured an inspiring cheer from the Student Council and a showing of the popular You Tube video *Green Pug Recycles*. A number of talented teachers and knowledgeable parents facilitated a variety of Eco-Stations. For example, *Locavore Special*, an activity about the benefits of eating fresh local produce, was facilitated by parent, Sharon Van Houten, from Van Houten Farms. The program benefitted from the support of the Evans Park Building Leadership Team (BLT) and the PTA. Environmental Awareness is one of the BLT's goals for 2010-2012.

Fieldstone Secondary School, North Rockland Central School District

Fieldstone ran its fourth Earth B.E.A.T. in 2010. The event was all outdoors, and the weather cooperated beautifully. Several Eco-Stations took full advantage of the surrounding natural habitat. *Sound Map* was conducted on the Minisceongo Nature Trail where the students' senses were not only treated to the sounds of nature, but also to the scents, sights, and feel of the environment. *Bugged about Water Quality* also took place next to the Minisceongo Creek. A morning collection from the creek's waters produced several exciting live examples of the macro invertebrates featured in the game.

Franklin Avenue Elementary School, Pearl River Central School District

Franklin Avenue Elementary scheduled their Earth B.E.A.T. event on Earth Day (April 22nd) each year. In 2009, Franklin Avenue launched their 'Earth Week' with the showing of *Wall-E*. During the next school day in the cafeteria, they weighed an unsettling amount of garbage left over from the students' lunchtime meal. They then discussed ways to pack a waste-free lunch. Throughout the week, a display of various household waste and their respective decomposition times was featured in the lobby. Used books and stainless steel canteens were sold to raise money for the school. Franklin Avenue kicked off their Earth B.E.A.T. event with an inspiring morning program that included the unveiling of *LIDeya*, a 16 ft. gardener made completely from bottle caps that had been collected for Aveda's bottle cap collection campaign. As part of their Earth Week celebrations, Franklin Avenue also planted a tree for Arbor Day, provided seedlings to all its students, and participated in the Great American Cleanup.

Link Elementary School, Clarkstown Central School District

In 2010-2011, Link Elementary School held its fourth Earth B.E.A.T. event. The 4th and 5th grade students, volunteer parents and teachers who participated in the day's activities were also part of a school-community partnership with Keep Rockland Beautiful and Clarkstown South High School. Zachary Ben-Haim, a senior in Clarkstown's Studio Television Production/TV and Video course, and the studio's teaching assistant, Ilisa Willenbrink, filmed the day's activities. Zachary used this footage in the production of a news report on the event for CCSD-TV. He and Albert Kim, another student in the production course, worked with KRB to produce several training tapes to aid future Earth B.E.A.T. facilitators. The TV Studio has partnered with KRB on a number of projects that have helped KRB programs.

New City Elementary School, Clarkstown Central School District

New City Elementary's Earth B.E.A.T. program has evolved over the years to include several Eco-Stations created by the school's parents and teachers. In 2009 and 2011, these included: *Conservation Scavenger Hunt* - students find wasteful energy use and recycling mistakes in a classroom, and *Reusable Charades* - students brainstorm ways to reuse products and act out their ideas for their peers. In 2009, the New City team brought in United Water representatives who ran their own activity on the lifecycle of a drop of water. The entire school had a waste-free lunch and each child was sent home with a fabric lunch sack for future use. New City capped off the day participating in the Great American Cleanup after school.

Thiells Elementary School, North Rockland Central School District

Thiell's two-day Earth B.E.A.T. event is a part of a whole month focused on environmental awareness. In April, students participate in a number of activities focused on environmental awareness, including class writing assignments on the environment and participation in the Great American Cleanup. Earth B.E.A.T. is organized by two of Thiell's 4th grade teachers, Heather Cruz and Mike Lanuti, who are also advisors to the Thiells Recycling Club. Thiells was the recipient of the 2010 Rockland Recycles Award. The team was presented with their award at the Rockland Solid Waste Management Authority's first Environmental Day on May 2, 2010.

Other schools that have participated in Earth B.E.A.T. include: Grandview Elementary; Highview Elementary; Lincoln Avenue Elementary; Laurel Plains Elementary; Little Tor Elementary; Margetts Elementary; North Garnerville Elementary; Reuben Gittelman Hebrew Day School (elementary and middle); Stony Point Elementary; Strawtown Elementary; Upper Nyack Elementary; Valley Cottage Elementary; Woodglen Elementary; El Dorado Middle School; Haverstraw Middle School; Orangetown Middle School; Nyack Middle School; Pomona Middle School; Willow Grove Middle School; James A. Farley Middle School; Suffern Middle School



Clarkstown Environmental Summit

On March 5, 2011, Clarkstown South and Clarkstown North High School students participated in the Town of Clarkstown's first Environmental Summit. Students and their teachers prepared and presented workshops for the day's Youth Summit. Jennifer Mazza and students in her International Baccalaureate course on Environmental Systems presented a workshop focused on how youth can reduce their ecological footprint. Students from Marine Biology and Biology courses, along with teachers, Khris Arvanites and Heidi Bernasconi, did an presentation on endangered species in the Hudson Valley and on plastic pollutants. A workshop presented at the end of the day presented by Kathy Galione, Project Coordinator at Rockland County AmeriCorps, focused the opportunities and benefits of environmental service. The aim of the Clarkstown Environmental Summit was to engage the entire community in learning about the environment and in exchanging ideas for sustainable policies and practices. The day included close to 40 workshops, an environmental exhibition, and an Eco-Camp, run collaboratively by the Town of Clarkstown's Recreation and Parks Department, Strawtown Studios, and Keep Rockland Beautiful.

Earth Day Celebrations

BOCES Earth Day

In April 2011, Rockland BOCES CTEC students hosted their 2nd Annual Earth Day celebration, sharing their knowledge and skills with middle and high school students from across the county. Each of the career and technical education programs prepared displays highlighting how their respective industries are responding to the need for greener, more earth-friendly practices. Student tour leaders and staff members led tour groups through the campus to classrooms and facilities where teachers and students explained how green technologies are changing industry.



Jesse Kaplan School

Students from the Jesse Kaplan School kicked off Earth Day 2009 with the start of their virtual walk to New York City. Their 'walk' took them down along the Long Path to the George Washington Bridge. After crossing the bridge, they walked along the Henry Hudson Walking/Bike Path then crossed over to Central Park's Great Lawn. The students' virtual walk was later recreated with a live walk around the BOCES Fitness Trail. Physical Education

Teacher, James McGuire, along with several gifted administrators and teachers, created a memorable journey that included replicas of such landmarks as the George Washington Bridge and toll booth, the Great Lawn, Times Square, Radio City Music Hall, Broadway, and the Statue of Liberty. Students were encouraged to pick up and dispose of trash that they spotted along the way. The walk was used to promote walking and decrease dependence on driving. The event occurred through the collaboration of the Kaplan Education Department, the BOCES School Health Advisory Committee, the Facilities and Transportation departments, and several county agencies, including Steps to a Healthier Rockland and Keep Rockland Beautiful.



Great American Cleanup

The Great American Cleanup is a national campaign that gets nearly 4 million volunteers, working on behalf of thousands of local organizations across the nation, out into their communities to clean up litter and engage in a variety of beautification projects. Through this county's local affiliate, Keep Rockland Beautiful, over 3,000 volunteers get out to cleanup along Rockland streets, parks, and waterways.

North Rockland Central School District

In the spring of 2010, more than 100 students in the Rockland Central School District participated in the Great American Cleanup. The students collected roughly 600 pounds of trash, including 12 tires and several hundred pounds of scrap metal. Students from Willow Grove Middle School, Fieldstone Secondary School, and North Rockland High School targeted their effort on one common task – cleaning up the walking path along the Minisceongo Creek, which is located next to Thiells Elementary School. They also cleaned Suffern Lane and Thiells Mt. Ivy Road before reaching Thiells Elementary School. “We’re proud of our students for working so well together to beautify our neighborhood,” said Jennifer Luongo, Asst. Principal of Fieldstone Secondary School. “Working as a team, the students did an amazing job collecting all the refuse along the walking path.”

For the past several years, 5th, 6th, and 7th grade students at Haverstraw Middle School have participated in a Beach Cleanup along Hudson that is facilitated by both Keep Rockland Beautiful and the American Littoral Society.

Other schools that have actively involved their students in a cleanup include: A. MacArthur Barr Middle School; Bardonia Elementary School; Clarkstown South and North High Schools; Felix Festa Middle School; Hempstead Elementary School; James A. Farley Middle School; Link Elementary School; Nanuet High School; Nyack High School; Pearl River High School; Strawtown Elementary; Suffern Middle School; Suffern High School

Service Learning

North Rockland High School, North Rockland Central School District



The North Rockland High School Aspira Club, led by English teacher Sydney Valerio, is a chapter of Aspira of New York, Inc., a fifty year old non-profit organization whose mission is to develop leadership skills within its members. As a service learning club, Aspirantes carry out the organization's Triple 'A' Process in their yearly agenda. This process of Awareness, Analysis and Action, requires students to become aware of issues in their communities, analyze the possible ways of resolving these issues and create action plans that address the issues in concrete ways. The club's service learning process requires students to not only participate in community service projects, such as the Great

American Cleanup, but also in developing action plans that bring awareness to the human behaviors that contribute to the issues. Reflecting on these projects is an integral part of their service learning process. Many students are able to receive credit from their teachers for their service learning projects. Many of the club's projects focus on bringing awareness to social issues that undoubtedly have a palpable effect in their community and environment. The club focuses on leadership development throughout the school year through a variety teambuilding workshops and empowering cultural activities. It also provides college and scholarship assistance. In fact, two of its graduating Aspirantes in the last five years proudly earned the Gates Millennium Scholarship. The club is most proud of the quality projects it has created for the community, in addition to the sense of empowerment and the passion to *aspire* it instills in its members. Highlights over the past decade include:

“Read to Lead”—Aspirantes met weekly with elementary-aged at-risk students and helped them develop their reading skills.

ESL services—Aspirantes created a brochure in which all of the English as a Second Language services in the county were featured in order for non-English speaking community members to learn English. Brochures were placed in all district and community buildings. It has also been added to many of the websites.

DREAM Act—Aspirantes researched the Development Relief and Education for Alien Minors act and created an informative video about its influence in society.

PART III: RESOURCES FOR ENVIRONMENTAL EDUCATION

Environmental Organizations & Programs in Rockland

Cornell Cooperative Extension, Stony Point, NY

Cornell University Cooperative Extension of Rockland is an educational, non-profit organization that enables people to improve their lives and communities through partnerships that put experience and research to work. CCE's educational programming includes:

- The **School Garden Network (SGN)** is Rockland County's educational resource for schools with gardens or —growing windowsills that use garden-based learning activities to support curricular goals. The SGN is a collaboration of CCE Rockland Master Gardener Volunteers and Extension Educators, and is designed for all levels of gardening experience, for educators, administrators, staff and parents who are or want to be involved in establishing and maintaining a school garden. (<http://rocklandschoolgardener.blogspot.com/>) Cornell University offers an online course from the Department of Horticulture called "Teaching and Learning in the School Garden – Theory into Practice" that provides professional development for educators focusing on curriculum-based environmental and horticultural education. The university's Garden-Based Learning resources provide resources that support the engagement and empowerment of children through gardening education.
- The **4-H Youth Development Program** engages youth in grades K-12. The program has evolved from the original skill-oriented —corn and canning clubs to its present day programming which focuses on contemporary issues. Young people involved in 4-H experience a broad spectrum of education in life skills and human development based on research and knowledge from Cornell University, other land-grant universities, and the U.S. Department of Agriculture.
- CCE also offers **Environmental Education** programs. Through their Eco-Adventures program, children experience sailing, hiking a stream in Harriman State Park, and fishing for blue crabs, among many other enriching activities. The Nature Speaks program allows children to gain a more intimate understanding of nature and strives to create a human-nature collaboration between young people and their environment.

www.rocklandcce.org

Global Sports Alliance, North Rockland Schools

The Global Sports Alliance (GSA) is an official partner of the United Nations Environment Programme (UNEP). Their mission is to promote environmental awareness and action among sports and outdoor recreation enthusiasts around the world. GSA is a global network of "Teams" that want to leave a healthy environment for our future generations. Participating teams incorporate sustainability behaviors into their activities and display the GSA flag at events. <http://gsa-usa.org/>

Keep Rockland Beautiful, West Nyack, NY

Keep Rockland Beautiful is a non-profit affiliate of Keep America Beautiful. KRB works to promote a cleaner, healthier, more beautiful county through litter cleanup and prevention, environmental education, beautification and litter law enforcement programs. Programs for schools include:

- **Earth B.E.A.T.** (Basic Environmental Awareness Training), a one to two day school event in which students rotate in small groups through a series of interactive “Eco-Stations” focused on habitat and watershed preservation, energy conservation, and waste reduction. Students walk away having learned simple steps they can take to preserve the environment.
- **Rockland P.L.U.S.** (Planning Land Use with Students), an interdisciplinary high school program that examines the environmental and socio-economic issues associated with land use planning. The program culminates in a symposium where students work with local professionals in small collaborative teams to map out a healthy, sustainable community.
- **The Rockland Environmental Education Symposium** (R.E.E.S.), an annual conference for teachers, PTA and school leaders with workshops on experiential education, school gardens, recycling, healthy fundraising and other environmental topics. Participants share best practices, brainstorm strategies for meeting common goals and challenges, and learn more about available resources and models of collaboration and partnership.
- **Artful Receptacles**, a program that involves individuals, classes and student groups in the design and painting of trash cans that are installed in bus shelters throughout the county
- The **Great American Cleanup**, a county-wide effort in which 3000 volunteers pull 40 tons of trash from streets, streams and parks each spring

www.KeepRocklandBeautiful.org

Lamont Doherty Earth Observatory, Palisades, NY

LDEO is a Columbia University research facility hosting a wide array of scientific research projects on the Hudson River, climate change, volcanoes, earthquakes and other topics relating to the dynamic relationship between human and natural systems. Resources for local educators include public lectures, the annual Open House, undergraduate and graduate level classes, and outreach projects with public schools, such as A Day in the Life of the Hudson: Snapshot Day. This project, in partnership with the DEC’s Hudson River Estuary Program, brings school groups to the banks of the Hudson River to collect environmental data. Beyond just a field trip, participating groups engage in real science research in partnership with scientists at Lamont and other institutions. Data is entered into a rich data set from previous “Days in the Life”, and made available for classroom activities. <http://www.ldeo.columbia.edu/>

Rockland County AmeriCorps, New City, NY

Building community pride through service, Rockland County AmeriCorps (RCA) mobilizes environmental and literacy members and volunteers in a variety of non-profit, municipality and school based service projects. AmeriCorps members dedicate either 300 hours over a summer or 450 hours over one year to service initiatives. Environmental Corps members earn a \$1,959 living stipend and a \$1,000 educational award for completing 300 hours of environmental service.

<http://www.co.rockland.ny.us/ameriCorps/index.htm>

Land Use Leadership Alliance (LULA), PACE Law School, White Plains, NY

Rockland County legislature has funded participation by a select group of local community leaders in the LULA training for several years. The training involves four full days of workshops on land use planning, with a focus on conflict resolution through stakeholder analysis and an understanding of the opportunities for proactive planning within the land use planning decision-making process. <http://www.pace.edu/school-of-law/centers-and-special-programs/centers/land-use-law-center-0/land-use-leadership-alliance-training-program>

Rockland County Department of Health, Pomona, NY

The Health Department exercises policymaking and code enforcement authority over a wide array of environmental concerns, from drinking water supply to sewers, wells, housing conditions and related matters. A few programs have been particularly relevant to educators:

- **The School Health and Wellness Coalition:** The School Coalition is a collaborative of Rockland schools, organizations and businesses that meets quarterly to advance its mission to educate and provide opportunity for collaboration with the intended outcome of improved school, student and community health. Workgroups within the School Coalition work to promote the family meal, provide professional development, maintain a school resource guide and support farm to school initiatives. www.rocklandsteps.org/schools
- **Steps to a Healthier Rockland:** Steps to a Healthier Rockland is an initiative of the Rockland County Department of Health to address the burden of nutrition-linked chronic diseases such as obesity, diabetes and asthma. A team of health education professionals work with the community, schools and faith-based agencies to enhance capacity for making sustainable environmental and policy changes resulting in greater access to better nutrition and physical activity. They offer a wide range of programs that improve access to better nutrition and physical activity. These include labeling healthier menu options in restaurants and delis, providing guided walks in county parks, promoting worksite wellness and the Healthy Meeting Guidelines, initiating the Lose to Win teen and adult weight loss programs, and collaborating with multiple organizations and businesses to encourage healthy lifestyle choices. www.rocklandsteps.org

Rockland County Division of Environmental Resources, Pomona, NY

This office administers county parks, the county open space preservation program, the Environmental Management Committee, the Water Quality Coordinating Committee, the Soil and Water District and other programs. Each of these entities hosts meetings and public events featuring presentations by experts in environmental issues.

- The Volunteer Stream Monitoring Program provides training, equipment and coordination for volunteer groups interested in assessing the ecological wellbeing of a local stream. Groups survey aquatic insect life, test water for contamination, and take measurements of water volume, flow and the physical profile of the stream.
- Storm Drain Stenciling Project: Volunteers install “No dumping – drains to stream” decals on storm drains to prevent illegal disposal of waste oil, paint, grass clippings and other contaminants. <http://co.rockland.ny.us/environ/>

Rockland County Solid Waste Management Authority, Hillburn, NY

The Rockland County Solid Waste Management Authority is committed to protecting the environment and the health of the citizens of Rockland County by reducing waste that requires disposal in landfills. This includes recycling of containers and fiber, household hazardous waste disposal, yard waste and sewage sludge (“biosolids”) composting, and proper waste disposal. In order to increase community participation, the Authority has an education and outreach plan that provides assistance and resources to schools, businesses, and communities who need program development assistance. Group tours of the interactive Herb Reisman Environmental Education Center are also available. On the tour you will find out where our garbage goes, how recycling really works, how to turn leaves, grass and food waste into compost, how to properly dispose of household hazardous materials and other important issues affecting our environment such as energy and water quality. <http://www.rocklandrecycles.com/>

Rockland 21C, West Nyack, NY

Rockland 21C is a countywide partnership with a mission of ensuring the best possible future for every child by building a comprehensive support system that links family, school and community. The bulk of their resources are utilized in supporting and sustaining the growing network of community schools developed by Yale University's Bush Center for Social Policy. Rockland 21C provides Family Resource Center (FRC) programs that encourage family involvement in education. FRC coordinators arrange for targeted and school-wide preventive and strength-based programs, and work with many partner organizations. Seven school districts and Rockland BOCES now operate FRC programs in more than 40 elementary and middle schools across the county. <http://www.rockland21c.org/>

Citizen Action Organizations in Rockland

Rockland Audubon Society

The Rockland Audubon Society is a chapter of the National Audubon Society, a non-profit organization dedicated to the appreciation of nature and the preservation of a healthy environment. The chapter hosts lectures, fieldtrips, such as bird watching walks, bird habitat restoration activities, and bird population monitoring projects. During the annual Christmas Bird Count, dozens of local volunteers fan out across the County to identify and count bird species, contributing vital data for wildlife conservation efforts.

<http://www.rocklandaudubon.org/>

Rockland Sierra Club

The Rockland Sierra Club is a local chapter of the Sierra Club, a national environmental organization and activist network that dates back to 1892. The club is devoted to advocacy and education involving issues of global climate change, water conservation and habitat protection.

<http://newyork.sierraclub.org/LHG/RocklandSierra.htm>

Rockland Farm Alliance

Rockland Farm Alliance is a community coalition that was founded to facilitate local sustainable agriculture in Rockland County, NY, and to provide educational resources to the community on small-scale sustainable agriculture practices. Through hands-on learning programs and new community-supported small farms, RFA is striving to raise awareness around local food issues while increasing access to organic, locally grown produce. Cropsey Community Farm, RFA's first farm project, is a five-acre organic vegetable Community Supported Agriculture (CSA) farm in New City, NY, that supports 200 member families. www.rocklandfarm.org

Rockland Water Coalition

The Coalition is an activist network opposed to United Water's proposed desalination plant that would be built in Haverstraw and turn brackish Hudson River water into drinking water to augment Rockland's water supply. The group organizes public education events. <http://sustainablerockland.org/>

Rocknet

RockNet is an environmental e-list that was formed in 1996 and continues to provide a forum for the exchange of information, news and commentary on important environmental issues facing Rockland County, New York and the Hudson River Valley. The membership base consists of environmental professionals, government officials, attorneys, teachers, community leaders, activists and interested citizens. To subscribe to RockNet, send a blank e-mail to: rocknet-subscribe@npogroups.org You will be sent a confirmation notice. Reply to the confirmation notice to be added to the list. Direct all questions to the list manager: George Potanovic, Jr. RockNet Admin rocknet-request@npogroups.org

Environmental Organizations & Programs in the Region

CELF Children's Environmental Literacy Foundation, Chappaqua, NY

CELF provides consulting services, training programs and educational programs, in order to make sustainability education an integral part of the K-12 learning experience. They offer programs for educators, students and the community, as well as consulting services and provide training to bring sustainability education into the classroom. The Eco-Footprinting program is a full-day workshop where students investigate five "eco-stations" in their school, learning about resources consumed everyday as the school provides heat, water, electricity, paper, food and transportation. The Summer Institute for Sustainability Education in collaboration with Manhattanville College helps teams of educators from across the USA re-design curriculum. CELF also helped initiate the Green Schools Coalition of Westchester and its annual conference. <http://www.celfeducation.org/>

Cloud Institute, New York, NY

The Cloud Institute equips school systems K-12 and their communities with the core content, competencies and habits of mind that characterize education for a sustainable future. The Cloud Institute has worked with the Putnam Northern Westchester BOCES and area teachers to integrate sustainability education into school curricula. The Cloud Institute's work connects trainings for teachers and school leaders in New York to national events and programs, providing access to best practices in the fields of environmental education, youth engagement, systems thinking and organizational learning. www.cloudinstitute.com

DoRight Leadership Corp, Brewster, NY

DoRight Leadership Corps (DLC) is a Youth Action Network and interdisciplinary curricular program for middle and high school students. The DLC integrates core academics with community-based project work in entrepreneurship, 21st century skills and sustainability through three action departments: Do Right Enterprises where youth work as "employees" of a consulting "company" that provides sustainability audits and efficiency analysis for local businesses, schools, hospitals, and community centers; Legislative Action where students conduct research/analysis and form action groups around specific legislation; Public Relations where students use all forms of media and the arts in teach-ins, editorial campaigns, forums and events to raise public awareness and knowledge of sustainability issues. DoRight chapters can be set up within academic curricular programs in schools or universities, as after-school programs, or as private chapters within local communities or in home school settings.

<http://scottbeall.com/dorightsummary.htm>

Garrison Institute, Garrison, NY

The Garrison Institute is non-sectarian, not-for-profit organization that explores the intersection of contemplation and engaged action in the world. Their program initiatives - Contemplation and Education, Transforming Trauma, and Transformational Ecology - create rigorous, innovative, contemplative-based tools and approaches to help teachers, caregivers, human service providers, environmentalists and others on the front lines of social and environmental engagement.

<http://www.garrisoninstitute.org/>

Groundwork Hudson Valley, Yonkers, NY

Groundwork Hudson Valley is an environmental justice non-profit that works with communities to improve their physical and social environment. Some of these projects are done through school programs and many of them are intergenerational. The Science Barge, moored on the Yonkers waterfront, is a popular school field trip or family destination. It is a working, sustainable, urban farm, equipped with greenhouses, hydroponic vegetable gardens, and a variety of alternative energy devices. All Groundwork projects engage local residents in hands-on projects, from design to planting. For example, the Neighborhood Greening project works with local agencies and community groups to create community gardens, playground and other urban assets. Groundwork also leads the Saw Mill River Coalition, a watershed restoration project that has resulted in the “daylighting” of part of the river in downtown Yonkers to form a new green space. <http://www.groundworkhv.org/>

Hackensack Riverkeeper, Hackensack, NJ

Hackensack Riverkeeper is dedicated to protecting, preserving and restoring the Hackensack River and watershed. Hackensack Riverkeeper carries out this mission through environmental education and outreach, open space preservation, clean water advocacy, and enforcement of environmental regulations and laws. Programs include bird walks, eco-boat cruises, paddling, and river cleanups.

<http://www.hackensackriverkeeper.org/>

Highlands Environmental Research Institute (HENRI), Tuxedo, NY

The Highlands Region of Connecticut, New York, New Jersey & Pennsylvania, which includes Sterling Forest and Harriman and Bear Mountain state parks, has been recognized by the U.S. Congress as an area of national significance. The Highlands Environmental Research Institute (HENRI) was established as a clearinghouse to coordinate environmental research, disseminate environmental knowledge, and promote its application in the work of conserving the Highlands natural resources. HENRI provides unbiased, scientifically based information about conditions in the Highlands, current trends, and probable outcomes. Information and technical assistance from the HENRI aids private landowners, citizens groups, and government agencies in their efforts to conserve the Highlands and build a sustainable future for the region. <http://henri.newark.rutgers.edu/>

Highlands Coalition, Bethlehem, PA

The Highlands Coalition is a four-state alliance of nearly 200 nonprofit, municipal, state and federal organizations working collaboratively to protect vitally important natural resources in the Highlands of Pennsylvania, New Jersey, New York, and Connecticut, an area of 3.5 million acres under federal recognition. The Coalition helps local conservationists share ideas and experiences.

<http://www.highlandscoalition.org/>

Hudson River Foundation, New York, NY

The Hudson River Foundation (HRF) seeks to make science integral to decision-making with regard to the Hudson River and its watershed and to support competent stewardship of this extraordinary resource. HRF is working to attain these goals by supporting scientific research and communicating to expand knowledge about the river among the scientific community, policy makers, and the public at large. The foundation also pursues initiatives to enhance management of the Hudson ecosystem, education about the River, and physical improvements to the riverfront. The Foundation sponsors workshops and conferences, bringing together authorities working within the Hudson River Valley and elsewhere to discuss scientific and public policy issues. Reports from these meetings give direction for further scientific work and improve the information used as a basis for public policy decisions.

<http://www.hudsonriver.org/hrfund/>

Hudson River Museum, Yonkers, NY

The Hudson River Museum, located on the banks of the Hudson River, offers multi-disciplinary exhibitions, teaching initiatives, research, collection, preservation, and conservation programs. It has an art gallery and a historic building with period furniture. One popular permanent exhibit is a massive relief model of the Hudson River valley that fills a whole room and shows all the towns, tributaries and major landmarks along the river. <http://www.hrm.org/aboutus.html>

Hudson River Sloop Clearwater, Poughkeepsie, NY

The Sloop Clearwater is a floating classroom whose mission, according to founding folk singer Pete Seeger, is bring people onto the river, thereby instilling a sense of wonder and personal stewardship responsibility. The Clearwater organization conducts class fieldtrips and citizen science aboard the sloop. Students help raise the sails, navigate the boat and set and haul in a fishing net on this 106' replica of a 19th Century Dutch wooden sailing sloop. The larger organization advocates for policies protecting the Hudson River and its tributaries, and promoting environmental awareness. Teachers can easily access pre- and post-boat trip curricula on the Clearwater website which fulfill NYS learning standards and focus on topics such as navigation, Hudson River ecology, art history and biology. www.clearwater.org

Hudson River Watershed Alliance

The mission of the Hudson River Watershed Alliance is to protect, conserve and restore the water resources of the Hudson River Basin through collaborative outreach, education, networking, science, information sharing and technical assistance by and for the stakeholders of the region. The Alliance holds an annual conference that is a regional training opportunity for local watershed and conservation organizations along with local governments in the Hudson Valley region. Participants include volunteers, board and staff members, restoration practitioners, local leaders, and funders.

<http://www.hudsonwatershed.org/>

***Maryland Association for Environmental and Outdoor Education (MAEOE)**

The Maryland Association for Environmental and Outdoor Education (MAEOE) is also a nonprofit educational association that seeks to serve teachers and environmental educators with training programs, workshops, conferences, awards programs, networking opportunities, publications, and related materials and resources. Their Professional Environmental Educator Certification is a voluntary, statewide certification program for professional environmental educators developed by MAEOE, with accreditation from the North American Environmental Education Association (NAAEE), to accomplish the goal of improving environmental education training and materials and increasing their use in the formal and informal education. MAEOE also runs the successful Maryland Green School Awards Program. Among other criteria, schools must demonstrate classroom integration of environmental issues instruction, professional development, selected conservation management best practices (BMPs), and sustained school-community partnerships to enhance environmental learning. <http://www.maeoe.org/>

*MAEOE offers exemplary models for supporting school greening in NY state

New York Agriculture in the Classroom (NYAITC)

Established in 1985 as a partnership between Cornell University, the NYS Department of Agriculture and Markets, the NYS Education Department, and the New York Farm Bureau, NY AITC educates youth, teachers, and consumers about agriculture and the food and fiber system. NYAITC provides curriculum and resources, conducts educational workshops, and provides start-up funding for projects.

<http://www.nyaged.org/aite/index.html>

New York Coalition for Healthy School Food

The New York Coalition for Healthy School Food (NYCHSF) is a statewide nonprofit that works to improve the health and well-being of New York's students by advocating for healthy plant-based foods, including local and organic where possible, farm to school programs, school gardens, the elimination of unhealthy competitive foods in all areas of the school (not just the cafeteria), comprehensive nutrition policy, and education to create food- and health-literate students.

<http://www.healthylunches.org/index.htm>

New York/New Jersey Trail Conference

The NY/NJ Trail Conference is a nonprofit organization located in Mahwah, NJ, that takes responsibility for the design, construction and maintenance of most hiking trails in state parks in the metropolitan region, including the Catskills. The Trail Conference hosts hikes, sells maps, coordinates volunteer trail building projects, and advocates for the trail care and usage. <http://www.nynjtc.org/>

New York State Department of Environmental Conservation

The NYS DEC manages a wide array of conservation and environmental law enforcement activities. Of particular interest to teachers are:

- **Green Schools Challenge** This program encourages student and teacher participation in recycling and recognizes those schools that are working toward responsible solid waste management. <http://www.dec.ny.gov/chemical/43349.html>
- **Hudson River Estuary Program** protects and improves the historic and scenic Hudson River watershed for all its residents. It aims to ensure clean water, protect and restore fish and wildlife habitats, provide recreation in and on the water, adapt to climate change, and conserve the scenic landscape. The Estuary Program offers training, technical assistance, and teaching resource materials to schools and non-formal educators along the Hudson. The HREP offers a number of opportunities to volunteer with Citizen Science projects, including hands-on projects on eel and amphibian migrations and stream buffer zone restoration. www.dec.ny.gov/lands/5102.html
- **School Seedling Program** The DEC's Saratoga Tree Nursery has several different species available, free of charge, to participants in this program. The School Seedling Brochure and Order Form (PDF) (101 Kb) is available for downloading. <http://www.dec.ny.gov/animals/9393.html>
- **New York's Watchable Wildlife** Whether it's the spectacle of a soaring eagle or a glimpse of a river otter, here you'll find what you need to plan a great wildlife viewing experience in New York State. NYSDEC's wildlife experts help you learn where to find wildlife, what sounds to listen for, or when to look for your favorite animal. <http://www.dec.ny.gov/outdoor/55423.html>
- **Stony Kill Farm Environmental Education Center, Department of Environmental Conservation.** Stony Kill Farm EEC in Westchester is an education center dedicated to enhancing environmental awareness and appreciation of the natural world. This facility includes over 1000 acres of farmland, ponds, woodlands, fields and trails. The Center provides hands-on, curriculum based education programs and guided outdoor programs developed by professional environmental educators to enhance classroom learning while incorporating Math, Science and Technology (MST) standards... <http://www.dec.ny.gov/education/1833.html>

New York State Energy Research and Development Authority (NYSERDA)

NYSERDA is a public benefit corporation that has many energy programs, including assistance with energy conservation, low-income energy support, renewable energy incentive programs, and energy education. The **Energy Smart Students Program** provides teachers and students with opportunities to learn about energy and its impact on the environment and economy. It offers curricula and hands-on application-based instructional support for classroom lessons in energy and energy efficiency. NYSERDA seeks teachers as partners in educating our youth to promote conversion to energy-efficient home practices. They offer workshops to raise participants' Energy IQ – and increase their ability to promote understanding and action among students. <http://www.nyserda.ny.gov/Program-Areas/Energy-Efficiency-and-Renewable-Programs/Residential>

New York State Outdoor Education Association (NYSOEA)

NYSOEA is a professional association dedicated to environmental education. Its goals are to promote public awareness of the value of outdoor and environmental education and interpretation; foster a lifelong appreciation and sense of stewardship for the environment; help classroom teachers and youth leaders use the outdoors to enrich their curricula and programs; and assist members in expanding their knowledge and skills in using the environment for responsible educational purposes. They act as a unified voice in support of environmental education, outdoor education, interpretation and outdoor recreation. <http://nysoea.org/>

Riverkeeper, Ossining, NY

Riverkeeper is an independent, member-supported environmental organization focused on citizen lawsuits against polluters, and monitoring the river using the Riverkeeper Boat. Riverkeeper's mission is to protect the ecological integrity of the Hudson River and its tributaries, and to safeguard the drinking water supply of New York City and the lower Hudson Valley. Current advocacy campaigns focus on Indian Point, water pollution, river ecology and drinking water. www.riverkeeper.org

Scenic Hudson, Poughkeepsie, NY

With its campaign, "Saving the land that matters most," Scenic Hudson is a leading advocate for open space preservation, public access to the Hudson River shoreline, and sound regional and local land use planning process. Scenic Hudson's team of experts combines land acquisition, support for agriculture, citizen-based advocacy and sophisticated planning tools to create environmentally healthy communities, champion smart economic growth, open up riverfronts to the public and preserve the valley's inspiring beauty and natural resources. To date Scenic Hudson has created or enhanced more than 40 parks up and down the Hudson River and preserved more than 25,000 acres of land. www.scenichudson.org

Stone Barns Center for Sustainable Food and Agriculture, Pocantico Hills, NY

Stone Barns Center for Food and Agriculture is a non-profit farm and education center located in Pocantico Hills, New York. Stone Barns operates an 80-acre four-season farm and is working on broader initiatives to create a healthy and sustainable food system. Through their Growing Farmers Initiative, children's education programs, and public awareness programs, they aim to improve the way America eats and farms. Education programs at Stone Barns are comprised of school field trips, farm camp, after-school groups and scout programs that target different audiences of children from elementary school to high school age. All programs require students to participate in aspects of the farm, from animal care to vegetable gardening. All Stone Barns school programs are tied to New York State learning standards. Stone Barns is open to the public year-round. www.stonebarnscenter.org

Sustainable Hudson Valley, New Paltz, NY

Sustainable Hudson Valley's mission is to speed up the shift to a low-carbon economy with high quality of life for all, by bringing people together with knowledge and each other. They advance this mission in two primary ways - Challenge campaigns and Knowledge Sharing. <http://www.sustainhv.org/>

Teaching the Hudson Valley, Hyde Park, NY

Teaching the Hudson Valley (THV) helps educators discover, appreciate, and share the region's natural, historic, and cultural treasures with children and youth. THV fosters collaboration among schools, museums, parks, historic sites, art galleries, libraries, and other groups. THV's growing collection of free K-12 lesson plans uses significant Valley sites to teach virtually all subjects. Their grant programs help make it easier for teachers to get students out of the classroom and into the community. Their summer institute and other programming offer opportunities for school and informal educators to meet and exchange ideas. <http://www.teachingthehudsonvalley.org/>

Nature Centers, Farms and Farmers Markets in & around Rockland

Bear Mountain Zoo, Bear Mountain, NY

Located across Route 9W from the Bear Mountain Inn, the Zoo features animals that are natives to the park, and that have suffered an injury requiring captivity in order to survive. Bear, beaver, deer, fox, eagle, and other animals are displayed in a naturalistic setting. The winding outdoor path among the animal exhibits is a self-guided nature trail featuring information on forest ecology and the geology of the area. The zoo also features indoor exhibits on revolutionary war history, Native Americans and reptiles. The location allows for easy access to nearby revolutionary war fort and walkways along the Bear Mountain Bridge and down to the waterfront. <http://www.trailsidezoo.org/>

Beczak Environmental Education Center, Yonkers, NY

A popular school fieldtrip destination on the banks of the Hudson River, the Beczak Environmental Education Center helps children and adults explore and appreciate the natural wonders of the Hudson River. Interactive programs include measuring tides, petting eels, using seines to capture Hudson River fish, and a range of other activities correlating with the NYS Department of Education Learning Standards for science, math, language arts, social studies and the fine arts. <http://beczak.org/>

Green Chimneys, Brewster, NY

Green Chimneys is a non-profit organization with a mission of restoring possibilities and creating futures for children with emotional, behavioral, social and learning challenges through educational, therapeutic and outreach services, while providing care for animals and nature. Green Chimneys operates residential treatment for children, and a special education school. The campus houses a Farm and Wildlife Center and the Clearpool Education Center, a year-round second campus for public school partners as well as other educational and human service organizations. <http://www.greenchimneys.org/>

Greenburgh Nature Center, Greenburgh, NY

The Greenburgh Nature Center (GNC) is a 33-acre nature preserve with trails, a pond, an old orchard succession site, and gardens. The property is a significant wildlife habitat refuge, both for indigenous species and for the hundreds of species of migratory birds that use it as a resting place on their spring and fall travels. Hands-on teaching at the GNC features the Center's collection of live animals and focus on how ecosystems work and how humans can live more sustainably. In addition to hosting school groups and the public as visitors, GNC provides off-site educational programming in Westchester and Rockland Counties. <http://greenburghnaturecenter.org/about-us.html>

Hudson Highlands Nature Center, Cornwall, NY

The center offers educational programs for the public that focus on the unique ecology of the Hudson Highlands. The Center houses a Nature Museum and offers weekend nature programs. <http://www.hhnaturemuseum.org/>

Matterhorn Nursery, Spring Valley, NY

At Matterhorn, students learn about the natural environment in a hands-on, experiential way through their Environmental Trail. Tours are led by a team of guides, who also provide a basic introduction to Matterhorn and its magnificent gardens, woodlands, natural ponds, and greenhouses. The tour is designed for Nursery-Grade 5.

<http://matterhornnursery.com/>

Farmers Markets and Farms in and around Rockland

<http://www.agmkt.state.ny.us/>

The Pfeiffer Center, Chestnut Ridge, NY

The Pfeiffer Center's mission is to spread awareness of the biodynamic farming method which improves soil vitality and the taste and nutritional quality of foods. The Pfeiffer Center also fosters the use of gardening and experiential environmental education in local schools through the Outdoor Lesson, in which over 500 students per year visit Duryea Farm, the Pfeiffer Center and the Jessup Center, a living museum of local rural heritage, with a "please touch" collection of antique farm tools. Activities include: Maple sugaring, cider pressing, corn shucking, working in the greenhouse and fields, and interacting with farm animals. Pfeiffer also offers year-long training in biodynamic farming.

- In the **Outdoor Lesson**, children age 5 and up engage in a wide variety of gardening activities, with particular emphasis on Rockland County's agricultural heritage, the origins and contents of the foods we eat, and the connections between human labor and the food on our table. Season and age-appropriate activities and tasks complement school curricula. The "classrooms" are field and barn, forest path and greenhouse. Observation of the natural world and humankind's working partnership with nature is the cornerstone of the Outdoor Lesson.

www.pfeiffercenter.org/outdoorlesson

Rockland Lake Nature Center, Congers, NY

The Nature Center is located on the north end of Rockland Lake. It features displays about the Ice Industry, Native Americans, the local Davies family, the beginnings of the Palisades Interstate Park Commission, and the wildlife of the area. <http://www.trailsidezoo.org/about/rockland-lake-nature-center>

Skylands: NJ Botanical Gardens, Ringwood, NJ

The New Jersey State Botanical Garden is a part of Ringwood State Park, New Jersey Division of Parks and Forestry, Department of Environmental Protection. The New Jersey State Botanical Garden at Skylands appears on both the State and National Registers of Historic Places. <http://njbg.org/>

Stony Kill Farm Environmental Education Center, Department of Environmental Conservation
(see NYS DEC above)

Tenaflly Nature Center, Tenaflly, NJ

The Tenaflly Nature Center is a non-profit member-supported nature preserve. Their mission is to protect almost 400 wooded acres and its inhabitants and teach the next generations to do the same. The Center offers Eco Tours, public programs, an after-school series, and a summer nature day camp.

<http://www.tenafllynaturecenter.org/>

Tiorati Workshop for Environmental Learning, Harriman State Park, NY

Managed by the Graduate School at Bank Street College, the Tiorati Workshop for Environmental Learning provides programs in nature exploration and hands-on science using both a rustic indoor laboratory, and the forest and shoreline around Lake Tiorati in Harriman State Park. Bank Street College educators use this venue for both the professional development of teachers and to provide outdoor learning experiences for K-12 students. The Tiorati Workshop welcomes inquiries from Rockland County school groups. For more information, contact Jenny Ingber, Ph.D. at

jingber@bankstreet.edu

Weis Ecology Center, Ringwood, NJ

Participants can sign up for interpretive hikes, workshops or other events (maple sugaring to cross-country skiing to a hike-a-week) designed to help people become more knowledgeable about the outdoors and explore nature. Weis also offers day environmental education programs to schools, scouts and environmental or educational groups. Instructors use the forests, fields and streams as an outdoor classroom for learning. Programs are held on-site or they can bring programs to you.

<http://www.njaudubon.org/SectionCenters/SectionWeis/Introduction.aspx>

Nature Camps in & around Rockland

Camp Addison Boyce, Tomkins Cove, NY

This camp, which is owned and operated by Girl Scouts Sacred Heart of the Hudson, is situated on 360 acres bordering the Harriman State Park System. It is available to school groups for overnight programs. http://www.girlscoutshh.org/camp_addisone_boyce.php

Nature Academy, Mad Science of the Mid-Hudson, Goshen, NY

Mad Science is offered through the Clarkstown Community Learning Center, Clarkstown Recreation and Parks, Orangetown Parks and Recreation, and Ramapo Parks and Recreation. Children explore the natural world and participate in activities such as making plaster casts of animal tracks, tie-dying t-shirts, and building bird feeders. They study the feeding habits of owls, learn about geology by growing their own crystal garden and breaking open their own geode. Open to Grades K – 5.

<http://madscience.org/locations/MidHudson/>

The Nature Place, Chestnut Ridge, NY

The Nature Place is a non-competitive, nature-oriented day camp. Activities at the Nature Place include swimming, storytelling, camping, earth art, music, drama, cooking, and hiking. At the Nature Place, children explore the eco-dynamics of Rockland County, our living/learning environment.

www.thenatureplace.com

Sharpe Reservation, Fishkill, NY

The Fresh Air Fund's Sharpe Reservation has 2,300 acres of land with lakes, ponds, streams and hiking trails through the woods. Located in the Hudson Highlands near Fishkill, NY, Sharpe Reservation is the site of The Fresh Air Fund's five summer camps, where 3,000 children get a break from city life each summer. During the rest of the year, Camp Mariah, Hidden Valley and Camp Tommy serve as residential facilities, where each year over 10,000 children from community and school groups as well as Girl Scout troops visit to learn about the environment. Groups also make use of the Sharpe Environmental Center, the Gufstafson Planetarium, our high and low ropes courses, and the numerous nature trails across the Reservation. The Sharpe environmental programs enhance school curricula through a hands-on learning experience that can only be achieved in an outdoor setting.

<http://www.freshair.org/programs/sharpe-reservation>

Strawtown Art & Garden Studio, West Nyack, NY

Strawtown offers "Living Classroom" school programs that feature outdoor lessons with school groups at streams and waterways near the school. Classes cover nature, ecology, natural science, art, and local and regional history, and meet state curriculum standards. The hands-on teachings include watershed awareness, working with natural materials, rustic skill-building, and native plant study. The Strawtown waterway education program was nominated for the 2008 *Hudson River Watershed Alliance* Stewardship Award. Lead artist/educators, Laurie Seeman and Joanna Dickey, have been working together for 7 years. www.strawtownstudio.com

Wellspring Living Arts, Upper Nyack, NY

Wellspring Living Arts is a nonprofit organization that runs custom-designed youth development programs involving the construction of greenhouses and other community assets at schools and other sites. Each Wellspring project arises from a need within the greater community, and through this approach Wellspring aids the well-being of organizations and their neighborhoods. Students delve into trades and crafts paired with academics and environmental education. Wellspring's format lends itself to awakening the senses via a student's individual and collaborative experience of real processes. Students grow into self-directed, critical-thinking individuals, and are more capable in fulfilling their personal potential. www.wellspringlivingarts.org

Independent Environmental Educators

Rockland BOCES, Arts in Education & Exploratory Enrichment Catalog

This catalog contains programs in environmental education available to teachers and students in Rockland. Funding for these programs is available through the CoSer program.

<http://www.myschoolpages.com/schools/rocklandboces/uploads/PDC/Arts%20in%20Ed%20&%20EE%20for%20web.pdf>

Putnam/Northern Westchester BOCES, Center for Environmental Education

This site lists programs that are available to teachers and students in schools in Westchester, Putnam, Dutchess, Rockland, Orange and Ulster counties. It lists services provided directly by PNW BOCES CEE Staff and independent environmental programs, both of which are eligible for state aid.

<http://www.pnwboces.org/Environmental/Programs.htm>

Rockland Forager: Living Wild in Suburbia

Paul Tappenden is an accomplished painter and photographer who has spent many years living with the land and studying many species of wild plants growing in the lower Hudson Valley. His main interest is the edible, medicinal and useful plants. Paul practices and teaches safe and sustainable foraging, as well as wild food preparation. He runs regular workshops (for ages seven years old and above), helping people to identify common wild edibles and their poisonous look-alikes. Several of these will include sampling and preparing wild food recipes. Paul will also be working in conjunction with Cornell University Cooperative Extension to bring workshops to local schools and summer camps.

http://www.suburbanforagers.com/Suburban_Foragers/Suburban_Foragers.html

Professional Development Opportunities for Educators

Cary Institute of EcoSystem Studies

The Cary Institute of Ecosystem Studies is dedicated to the creation, dissemination, and application of knowledge about ecological systems. This knowledge is created through scientific research, disseminated through teaching, writing, and exhibits, and applied through participation in decision-making regarding the ecological management of natural resources and through promotion of a broader awareness about the importance of ecological relationships to human welfare. Cary offers professional development institutes for teachers to learn more about current science, techniques for engaging their students in scientific inquiry, and ways to incorporate models of research-proven teaching methods into their classrooms. <http://www.ecostudies.org/>

The Center for Environmental Research and Conservation (CERC)

CERC is a consortium of five scientific institutions based in New York City: Columbia University, the American Museum of Natural History, the New York Botanical Garden, the Wildlife Conservation Society and EcoHealth Alliance (formerly known as Wildlife Trust). Each member of the consortium contributes to developing environmental leadership through a variety of education and research programs. CERC is headquartered at the Earth Institute, Columbia University. Its programs include a Certificate Program designed to provide professionals with the knowledge and tools to be effective environmental leaders and decision makers in the 21st century. <http://cerc.columbia.edu/?id=home>

Child Development Institute, Sarah Lawrence College

Through outreach to teachers, parents, administrators, community coalitions, and others committed to facilitating the growth of healthy, creative children, the Child Development Institute at Sarah Lawrence College communicates a progressive educational philosophy and provides a forum for the discussion of issues related to children, childhood, and education. They address a wide range of topics and issues, including the importance of play, the diverse foundations of early literacy, the promise of teaching and modeling ethics, and the essential relationship between children and nature. www.slc.edu/cdi

Environmental Consortium of Hudson Valley Colleges and Universities

The Environmental Consortium of Hudson Valley Colleges & Universities was established to advance an understanding of the cultural, social, political, economic and natural factors affecting the Hudson River Watershed. The Consortium works to provide ecosystem-based curricular and co-curricular programming aimed at improving the health of the regional ecosystem. The Consortium offers a number of programs including an annual meeting and a unique professional development opportunity through participation in River Summer, where like-minded faculty come together in a quasi "College of the Hudson Valley" to create cooperative education and research opportunities. River Summer uses team teaching and participation among institutions that are geographically and ethnically diverse, with faculty who has access to a wide range of resources - from research universities to liberal arts and community colleges. <http://www.environmentalconsortium.org>

Northern Westchester/Putnam Board of Cooperative Educational Services (BOCES), Yorktown Heights, NY

Like Rockland BOCES, Northern Westchester/Putnam BOCES is an institution through which schools share services, such as teacher training and specialized educational programs. It's Center for Environmental Education (CEE) offers teacher training that aligns with its ongoing efforts to integrate sustainability principles into curriculum standards and offer enriching direct student services in the environmental sciences. BOCES coordinates state aid for environmental education services through the CoSer system of reimbursement.

<http://www.pnwboces.org/Environmental/ProfessionalDevelopment.htm>

Ramapo College

Ramapo College is part of the New Jersey Higher Education Partnership for Sustainability and has a long history of supporting environmental and sustainability education. In addition to an undergraduate degree program in Environmental Science and Environmental Studies, it now offers a Master of Arts in Sustainability Studies (MASS). This new program unites the natural sciences, social sciences, and business fields to develop leading practitioners in the emerging field of sustainability. Ramapo's Sharp Sustainability Education Center is a custom, green-built facility designed to demonstrate the components of a sustainable community, and currently includes solar and geothermal energy sources. The Center incorporates environmental literacy and understanding of sustainability into the Ramapo curriculum across disciplines. Students can take advantage of for-credit internship opportunities available in the Center, including programs from in-service training for students in teacher education to programming for area school children. In the summer of 2011, Ramapo College hosted a workshop, "The Hudson River in the Nineteenth Century and the Modernization of America," which offered K-12 teachers throughout the country a unique approach to teaching U.S. history through the humanities, using a place-based, multi-disciplinary approach. The workshop focused on the Hudson River in the nineteenth century. Participants worked with an expert teacher to develop lesson plans and apply what is learned to their own classroom needs. <http://www.ramapo.edu/>

Rockland Board of Cooperative Educational Services (BOCES)

Rockland BOCES is an intermediate level district that joins with the local school districts to provide them with programs and services that can be shared by all schools. BOCES provides: Student Services, which assist students with developmental disabilities, and emotional and/or learning challenges; Career and Technical Education, which trains students for specific careers; Adult Education and Business Services, which help adults earn their General Education Diploma (GED); and Educational Services, which educate teachers on ways to meet NYS requirements. It also provides students with enrichment programs.

Educational Services' Professional Development Center offers a wide range of professional development opportunities for teachers and administrators. The workshops, conference series, and blended learning models of professional development align to the current emphasis of work in New York State. The PDC has offered workshops, such as the 4E's of Energy Grades K-6, through NYSERDA. <http://www.rocklandboces.org/>

Rockland Community College

Rockland Community College has embraced the principles of environmental sustainability as an essential component of its academic curricula, administrative plans and plant facilities operations. The commitment of RCC to the environment was formalized in April 2008 on Earth Day when President Cliff Wood signed the Presidents Climate Commitment and the Talloires Declaration. The Technology Center has been awarded Silver Certification as a Leeds Green Building by the US Green Building Council. RCC is a charter member of the Environmental Consortium of Hudson Valley Colleges and Universities. The RCC Center for Personal & Professional Development is a member of the Hudson Valley Educational Consortium of five colleges which sponsors the Clean Energy Technology Training Initiative. RCC's Center for Personal and Professional Development offers continuing education workshops and certificate courses in the field of green energy technologies. A teleconference course is taught on greening food services through the development and implementation of sustainable practices. RCC offers an Associate in Science Environmental Science. Courses that cut across disciplines include Environmental Pollution in Science; Literature and Environment in English; Social Ethics and Human Values in Philosophy; and Ethics in Business in the Business Department. RCC has an organic garden and a certified wildlife habitat. RCC sponsors a yearly Earth Day Celebration. RCC is a member of Clean Air New York <http://www.sunyrockland.edu/continuing-education/center-for-personal-and-professional-development>

Rockland Teacher Center Institute

RTCI offers professional development opportunities, along with preservice and in-service coursework and collaborative programs, community and retiree resources and after-school student programs, through partnerships with colleges, libraries, museums and other institutional content providers. It provides community school-centered learning opportunities, global and local technology connections for educators, and opportunities for career development through programs such as the NYS Teacher Center Online Academy. RTCI does not currently offer courses specifically focused on environmental education, but it does provide teachers with the opportunity to develop technical and pedagogical skills that will be beneficial to developing environmental education programs in their respective schools. <http://rockteach.org/about>

National and International Organizations & Web Resources

Alliance to Save Energy

This site contains information about the Green Schools program, which promotes cost reductions for schools through energy saving measures. The site also contains teacher written lesson plans about energy. The companion kids site includes links to the Green Schools Gazette, a newsletter written by students, as well as links to several energy calculators. <http://www.ase.org/>

America's Great Outdoors Initiative (AGO)

The America's Great Outdoors (AGO) Initiative is a federal conservation and recreation agenda. During the summer of 2011, senior Administration official held 51 public listening sessions across the country, 21 of them specifically with youth. The outcome of the national was a report to the President that reflects ideas on how to reconnect with America's lands, waters, natural and cultural treasures and build on the conservation successes in communities across the nation. In addition to goals of providing jobs and career pathways, protecting and enhancing parks and green spaces, and cultivating stewardship, the administration plans to work with the Department of Education and other federal agencies to align and support programs that advance awareness and understanding of nature's benefits for clean air and clean water. The Initiative also works to support and expand existing federal programs that emphasize place-based, experiential learning. <http://americasgreatoutdoors.gov/>

Center for Ecoliteracy

The Center for Ecoliteracy works with representatives from schools and allied organizations to support educators in their efforts to advance schooling for sustainability. The Center considers the needs of public and independent schools and their larger communities. Their services focus on: curriculum integration and cross-discipline teaching strategies; development of hands-on teaching and learning projects; food as an organizing principle for encouraging ecological understanding; and gardens and the campus as learning environments. <http://www.ecoliteracy.org/>

Community Work Institute

CWI provides resources that include publications, trainings, and institutes that help to create and sustain a movement toward integrating service-learning, place-based and sustainability education. Their primary annual events take place at Shelburne Farms in Vermont and in Los Angeles at Loyola Marymount University. Outreach activities and workshops take place in other locations throughout the year. They use a field tested framework and faculty team, with a shared expertise and approach. Community Works Institute's alumni, and participants include K-16 and non-formal educators, along with students, administrators, program personnel, policy makers and community members.

<http://www.communityworksinstitute.org/cwoutreach/cwprofdvlp/cwinstitute/index.html>

Consumer Consequences/Sustainability Coverage

Consumer Consequences is a fun, interactive game designed to illustrate the impact of our lifestyles on the Earth. The site is part of American Public Media's™ special series, "Consumed," which explores whether the modern American lifestyle is sustainable in the long run.

<http://sustainability.publicradio.org/consumerconsequences/>

Cool Schools Challenge

The Cool School Challenge is a program of the Puget Sound Clean Air Agency, developed in collaboration with Redmond High School environmental science teacher and Puget Sound Energy's Powerful Choices for the Environment program. Conceptually modeled after the U.S. Mayor's Climate Protection Agreement, the Cool School Challenge aims to motivate students, teachers, and school districts to reduce carbon dioxide and other greenhouse gas emissions school wide. The site provides educational materials and activities for grades 7 – 12. www.coolschoolchallenge.org

Creative Change Educational Solutions

Creative Change Educational Solutions is a nonprofit organization advancing educational leadership and transformation through a lens of sustainability. The Michigan-based organization serves K12 schools, nonprofits, universities, and teacher education programs at the national level. Creative Change promotes a systems approach to transforming teaching and learning, using deep curriculum change to strengthen reform initiatives focused on equity, teacher quality, and "21st Century" learning. Guided by a capacity building model, they support institutions to plan and implement change in course structures, staff development, and other areas affecting instruction. Customized programs combine strategic planning, professional development, curriculum licensing, and instructional redesign. www.creativechange.net

Earth Day Network

The Earth Day Network is comprised of 22,000 partners and organizations in 192 countries. Its mission is to broaden, diversify and mobilize the environmental movement through a variety of education, public policy, and activism campaigns. Its Green Schools Campaign, in partnership with the U.S. Green Building Council and The Clinton Foundation, aims to green all of America's K-12 schools within a generation. EDN's Educator's Network, used by over 30,000 teachers nationwide, provides innovative education tools to promote civic participation and to develop a sense of environmental awareness. Earth Day Network's Policy Team, working closely with the Education Team, identifies legislative opportunities on the federal, state, and local levels that promote and fund environmental education, green school facilities, and enable the shift to a carbon-neutral economy.

<http://www.earthday.org/earth-day-2011>

Eco-Schools USA

Eco-Schools is a program that provides a framework to help educators integrate sustainable principles throughout their schools and curriculum. The Eco-Schools program was started by the Foundation for Environmental Education (FEE) with support by the European Commission and was later identified by the United Nations Environment Program (UNEP) as a model initiative for Education for Sustainable Development. In 2008, the National Wildlife Federation (NWF) was granted Eco-School host status for K-12 schools in the United States. Through school-based action teams of students, administrators, educators and community volunteers, Eco-Schools USA combines effective "green" management of the school grounds, the facilities and the curriculum. The Eco-Schools USA program is made up of seven steps, incorporating eight environmental pathways. Once a school has registered and implemented these seven steps, it can apply for an Eco-Schools award. <http://www.nwf.org/Global-Warming/School-Solutions/Eco-Schools-USA.aspx>

Edible Schoolyard

This is the website of Martin Luther King Jr. Middle School in Berkeley, CA. The site explains how students at this school plants, care for, harvest and cook food from their 1-acre school garden. The site includes generally environmental lesson plans, tips for starting and sustaining a schoolyard and links to many other sites. <http://www.edibleschoolyard.org/>

Edutopia: George Lucas Educational Foundation

Edutopia seeks to empower and connect teachers, administrators, and parents with innovative solutions and resources to better education. It promotes six core strategies for innovation and reform in learning: Integrated Studies; Project Learning; Social and Emotional Learning; Technology Integration; Teacher Development; Project Assessment. Environmental education is often the context in which these strategies are applied. <http://www.edutopia.org/>

Environmental Education Training and Partnership EETAP

EETAP is a consortium of nine nationally recognized leaders in environmental education, education, and professional development. EETAP conducts strategically-chosen activities in three broad areas: Advancing Environmental Education; Professional Development; Reaching Diverse Audiences. EETAP is funded by the U.S. Environmental Protection Agency's Environmental Education Division through a cooperative agreement with the University of Wisconsin-Stevens Point. EETAP supports a wide variety of programs, including a number of on-line tools such as: EE-Link (an Internet portal for EE information); EE-News (an online newsletter sent to education professionals); and EE-Jobs. EETAP supports professional development opportunities such as the on-line courses provided through the University of Wisconsin. It also provides resources for educators and classrooms. www.eetap.org

Facing the Future

Facing the Future provides curriculum resources, teacher workshops, and service learning opportunities that address pressing issues of sustainability such as climate change, population growth, poverty, and environmental degradation. The organization believes in the transformative power of widespread, systemic education to improve lives and communities, both locally and globally. Programming is designed by and for teachers, and brings critical thinking about global issues to students in every walk of life. <http://www.facingthefuture.org/>

FOSS – The Full Option Science System

FOSS is a research-based science curriculum for grades K—8 developed at the Lawrence Hall of Science, University of California at Berkeley. FOSS is also an ongoing research project dedicated to improving the learning and teaching of science. The FOSS program materials are designed to meet the challenge of providing meaningful science education for all students in diverse American classrooms and to prepare them for life in the 21st century. The scientific enterprise is both what we know (content) and how we come to know it (process). The best way for students to appreciate the scientific enterprise, learn important scientific concepts, and develop the ability to think critically is to actively construct ideas through their own inquiries, investigations, and analyses. The FOSS program was created to engage students in these processes as they explore the natural world. <http://www.fossweb.com/>

Go Green Initiative

This program is designed to create a culture of environmental responsibility on school campuses in the U.S. The Go Green Initiative unites parents, students, teachers and school administrators in an effort to make real and lasting changes in their campus communities that will protect children and the environment for years to come. <http://gogreeninitiative.org/>

Green Education Foundation (GEF)

GEF provides curriculum and resources to K-12 students and teachers worldwide with the goal of challenging youth to think holistically and critically about global environmental concerns and solutions. GEF couples standards-based curricula with active participation, acknowledging that children learn best through hands-on activities that enhance their critical thinking skills. GEF's Green In Action Awards are granted to schools, classes, or groups of Green Keepers. Participants in GEF programs send in photos, videos, and/or artwork that demonstrate the impact of their participation in a GEF environmental education project or eco-challenge (i.e. National Green Week, Green Thumb Challenge, Green Energy Challenge). <http://www.greeneducationfoundation.org/>

Keep America Beautiful

Keep America Beautiful, Inc. is a volunteer-based community action and education organization. KAB is comprised of a network of more than 1,200 affiliate and participating organizations. Keep America Beautiful combines education with hands-on stewardship to make America's communities cleaner, greener, safer, and more livable. Participating organizations address local challenges by engaging and inspiring community stewardship in three focus areas — litter prevention, recycling and waste reduction, and beautification and community greening. Keep America Beautiful provides its network with national programs, public awareness campaigns, and educational materials that can be used by our affiliates to benefit their local communities. <http://www.kab.org/site/PageServer?pagename=index>

KidsGardening.org

This site contains information on everything from grant opportunities and fundraising tips to curriculum and instructions for gardening and greenhouse usage.

<http://www.kidsgardening.org/>

National Environmental Education Foundation (NEEF)

The National Environmental Education Act of 1990 established the National Environmental Education Foundation as a complementary organization to the U.S. Environmental Protection Agency (EPA), extending its ability to foster environmental literacy in all segments of the American public as well as leveraging private funds that the EPA, as a federal agency, could not access. NEEF works with a network of health professionals, weathercasters, land managers and teachers to provide educational programs, which include: Classroom Earth and EE Week; Curricula Library; Green Reading; Earth Gauge and National Public Lands Day; Health and Environment Initiative and Business and Environment Initiative. <http://www.neefusa.org/about/index.htm>

National Farm to School Network

The National Farm to School Network sprouted from this desire to support community-based food systems, strengthen family farms, and improve student health by reducing childhood obesity. Eight regional lead agencies and national staff provide free training and technical assistance, information services, networking, and support for policy, media and marketing activities. The site provides news, resources, and networking opportunities. <http://www.farmtoschool.org/>

National Oceanic and Atmospheric Administration's Education Resources

The NOAA education community works collaboratively to advance the priorities outlined in NOAA's Education Strategic Plan and meet NOAA's Education Mission: "To advance environmental literacy and promote a diverse workforce in ocean, coastal, Great Lakes, weather, and climate sciences, encouraging stewardship and increasing informed decision making for the nation." NOAA's educational programs include: Bay Watershed Education and Training Program; Climate Communications and Education Program; Coral Reef Conservation Program; Teacher at Sea Program; and the Educational Partnership Program. NOAA services, such as the National Ocean Service and the National Weather Service provide information and through dedicated websites and resources. NOAA offers training and workshops for educators, scholarships, internships, and fellowships for students, and a variety of funding opportunities. <http://www.education.noaa.gov/>

National Wildlife Federation

The National Wildlife Federation works with members, partners and supporters in communities across the country to protect and restore wildlife habitat, confront global warming and connect with nature. NWF's School page contains educational resources, curriculum, games, and programs such as School-Tube, the student created and moderated site, School Habitats, and the HSBC Eco-Schools USA Climate Initiative. www.nwf.org

The Nature Conservancy - Environmental Action for the Future (LEAF)

The Nature Conservancy and The Ecological Society of America have formed a formal network for environmental high schools to share the best practices. LEAF's environmental high school partners work to ensure students are engaged in environmental lessons and activities throughout the school year. The LEAF internship program is one part of this partnership. The Nature Conservancy combines science and access to natural areas with the lessons learned in school to provide students with the web of mentors, alumni, and peers that is fundamental to successful youth development programs.

<http://www.nature.org/leaf/about/educators.html>

North American Association of Environmental Education

NAAEE is the professional association that promotes excellence in environmental education through advocacy and education. It provides and shares opportunities for professional development, networking, and conferences. The website links to a large number of environmental organizations and curriculum resources. NAAEE's **National Project for Excellence in Environmental Education** provides a series of guidelines that set standards for high-quality environmental education. The project was funded by the U.S. Environmental Protection Agency through the Environmental Education and Training Partnership (EETAP) and the U.S. Forest Service, plus the National Environmental Education and Training Foundation, the National Fish and Wildlife Foundation, Northern Illinois University, and World Wildlife Fund. <http://www.naaee.org/>

Project W.E.T. Worldwide Water Education

Project W.E.T. is a water education program and publisher. The program facilitates and promotes awareness, appreciation, knowledge, and stewardship of water resources through the dissemination of classroom-ready teaching aids and the establishment of internationally sponsored Project WET programs. <http://www.projectwet.org/>

Project WILD

The goal of Project WILD is to help teachers and youth leaders prepare students to develop problem-solving skills in exploring responsible human actions toward wildlife and the environment. Project WILD is an interdisciplinary and supplemental education program for grades K-12 that can be used to enhance all subject areas. <http://www.projectwild.org/>

Project Learning Tree Project Learning Tree® (PLT) is a multi-disciplinary environmental education program for educators and students in PreK-grade 12. PLT is a program of the American Forest Foundation. PLT provides the training, resources, and support teachers need to help them make outdoor experiences part of everyday lesson plans. PLT's GreenWorks grant program supports environmental neighborhood improvement service-learning projects. GreenWorks blends service activities with the academic curriculum and addresses real community needs as students "learn by doing." Some examples of past grant projects include habitat restoration, watershed improvement, outdoor classrooms, and energy conservation. <http://www.plt.org/>

National Science Foundation

The National Science Foundation (NSF) is an independent federal agency created by Congress in 1950 "to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..." NSF is the funding source for approximately 20 percent of all federally supported basic research conducted by America's colleges and universities. One essential element in NSF's mission is support for science and engineering education, from pre-K through graduate school and beyond. The research we fund is thoroughly integrated with education to help ensure that there will always be plenty of skilled people available to work in new and emerging scientific, engineering and technological fields, and plenty of capable teachers to educate the next generation. <http://www.nsf.gov/>

National Science Teachers Association

The National Science Teachers Association is a member-driven organization . It publishes books and journals for science teachers from kindergarten through college and holds four conferences each year on science education. The National Science Teachers Association is striving to be a leader and role model for science educators and students in conserving resources and looking for innovative ways to reduce, reuse, and recycle. NSTA's sustainability efforts can be seen in all areas of operations, including the construction of their new LEED platinum-certified headquarters—the John Glenn Center for Science Education. <http://www.nsta.org>

The National Service-Learning Clearinghouse (NSLC)

NSLC supports the service-learning community in higher education, kindergarten through grade twelve, community-based organizations, tribal programs, and all others interested in strengthening schools and communities using service-learning. NSLC offers: a website with information and resources to support service-learning programs, practitioners, and researchers; e-mail discussion lists focused on K-12 education, community-based learning, tribes and territories information, and higher education service-learning. A library collection is available to Learn and Serve America grantees and subgrantees, as well as program advisors with sector-specific guidance and expertise. NSLC has staff with the expertise to assist with materials, reference and referrals, information, and technical assistance. <http://www.servicelearning.org>

No Child Left Inside Coalition

The No Child Left Inside[®] Coalition is a national coalition of over 2000 business, health, youth, faith, recreational, environmental, and educational groups representing over 50 million Americans. The Coalition was formed in 2007 to alert Congress and the public to the need for our schools to devote more resources and attention to environmental education. The Coalition is working to support legislation sponsored by Rep. John Sarbanes of Maryland and Sen. Jack Reed of Rhode Island to ensure that every student achieves basic environmental literacy. The No Child Left Inside Act would amend the Elementary and Secondary Education Act (No Child Left Behind) to include environmental education for the first time. The legislation would provide new funding for environmental education, particularly to develop rigorous standards, train teachers and to develop state environmental literacy plans. It also proposes giving states that develop such environmental literacy plans access to additional funds.

<http://www.cbf.org/page.aspx?pid=687>

Northeast Sustainable Energy Association NESEA

NESEA offers professional development opportunities, curriculum, and resources for teachers and non-formal educators on energy efficiency, energy conservation, and on the science and applications of renewable energy. The education section of this site contains information on a variety of contests and competitions designed to get students thinking about sustainable energy, lesson plans and curriculum units and links to numerous sustainable energy sites. <http://www.nesea.org/education/>

The Story of Stuff Project

The Story of Stuff is a 20-minute animation with a critical view of the materials economy and consumption. The site includes a footnoted script, blog, and teaching resources.

<http://www.storyofstuff.com/>

Sustainable Schoolyards

This site illustrates some of the outdoor classroom concepts, ecological teaching tools, and creative play ideas that can be added to almost any schoolyard to contribute to active living, sustainable communities, and smart growth. <http://www.sustainableschoolyard.org/>

Sustainable Table

This site focuses on examining the types of food we consume for both nutritional value and for their impact on the environment. It includes teacher resource pages as well as information on factory farm practices and reasons to buy local food. <http://www.sustainabletable.org/>

Trout Unlimited

Trout Unlimited is a national organization with over 400 chapters throughout the United States. Its mission is to conserve, protect and restore North America's coldwater fisheries and their watersheds. The Headwaters Youth Education Initiative includes a Stream Explorers Youth Membership program and Trout in the Classroom. Trout in the Classroom offers students of all ages a chance to raise trout in a classroom setting and then release them into a nearby stream or river. During the eight months that classes spend raising trout, they closely monitor water temperature, water clarity, dissolved oxygen, ammonia levels, and pH. Because trout are extremely sensitive to changes in their environment, students learn the importance of clean water and environmental protection. <http://www.tu.org/>

U.S. Environmental Protection Agency

The EPA is an agency of the federal government charged with protecting human health and the environment, by writing and enforcing regulations based on laws passed by Congress. The agency also provides information and resources for use by the public to learn about the issues. This includes resources for both teachers and students, for example, at <http://www.epa.gov/students/>

U.S. Partnership for Education for Sustainable Development

The U.S. Partnership for Education for Sustainable Development's mission is to leverage the United Nations Decade of Education for Sustainable Development (2005-2014) to foster education for sustainable development in the United States. The USPESD's Teacher Education Sector developed Education for Sustainability (EfS) K-12 standards that begin to define what K-12 students should know and be able to do to be sustainability literate - included are three overarching standards followed by a table of topics and areas of study by grade bands. These standards are meant to be reached through a variety of pedagogical techniques that promote participatory learning and higher-order thinking skills and are intended to be integrated into core content teaching and learning across disciplines.

<http://www.uspartnership.org>

What's on Your Plate

What's on Your Plate is a documentary about kids and food politics. The website provides materials and games for kids and links to kid-friendly sites with more information on healthy food production and eating, including The Meatrix and The Story of Stuff. <http://www.whatsonyourplateproject.org/>