U.S. Department of Education
Green Ribbon Schools
2012

For Public Schools only: (Check all that apply) [ ] Charter [ ] Title I [ ] Magnet [ ] Choice

Name of ~~Principal~~ (Head of School) Ms. Kate Burke Walsh – Head of School
(Specify: **Ms.,** Miss, Mrs., Dr., Mr., etc.) (As it should appear in the official records)

Official School Name The Willow School
(As it should appear in the official records)
School Mailing Address: 1150 Pottersville Road
(If address is P.O. Box, also include street address.)
Gladstone New Jersey 07934
City State Zip

County Somerset State School Code Number* 36-0240-100

Telephone (908) 470-9500 Fax (908) 470-9545

Web site/URL: www.willowschool.org -mail: kwalsh@willowschool.org

I have reviewed the information in this application, including the award and eligibility requirements on page 2-4, and certify that to the best of my knowledge all information is accurate..

Date: March 20, 2012
(~~Principal's Signature)~~ (Head of School)

Name of Superintendent* NA (Specify: Ms., Miss, Mrs., Dr., Mr., Other)

District Name* NA Tel.( )

I have reviewed the information in this application, including the award and eligibility requirements on page 2-4, and certify that to the best of my knowledge all information is accurate. I concur that this is one of the highest performing green school applicants in our state.

NA Date
(Superintendent's signature)

PART II DOE Green Ribbon Schools: Summary of Achievements

The Willow School, a small, independent coeducational day school for students in kindergarten through eighth grade, is committed to combining academic excellence and the joy of learning and to experiencing the wonder of the natural world. Mastery of the English language is an essential element in an integrated curriculum that helps students comprehend the patterns of how things are connected and prepares them for all areas of their secondary education. The school is dedicated to maintaining an environment where respect for the individual, an outstanding faculty, and an understanding of place foster independent thinking, creativity, responsibility, and integrity. The Willow School education enables children to develop an ethical approach to all relationships, to realize their full potential, and to believe in their power to effect positive change.

The Willow School: A Brief Institutional Profile of "The Little Green Schoolhouse"

The Willow School (www.willowschool.org) – founded in 2000 by Mark and Gretchen Biedron – serves students in pre-kindergarten through eighth grade. As its mission statement makes clear, the school is committed to fostering academic excellence, a passion for learning, and the development of an ethical approach to all relationships – including humanity's relationship to the natural world, of which it is both a constituent part and chief steward. The inimitable education offered by the school enables children to acquire the skills, knowledge, and disposition they will need to think critically and creatively and become contributing citizens in a complex, challenging, and ever-changing world. It would be exceedingly fair to say, in fact, that The Willow School's approach represents a balance uncommon in today's world of Pre-K—8 education – in which we navigate an appropriate course, as it were, between the high-pressured scholastic environment in which the nurturing of students is ignored and the irresponsible pedagogy that primarily seeks to make students feel good about themselves but ultimately neglects traditional academics.

Although not originally intending to "go green", the school recognized the inextricable link between human virtue and ecology. From the virtues program, which was designed to mentor the ethical relationships between humans, grew the commitment to cultivating that same type of ethical relationship between humans and the natural world and to developing a sense of personal stewardship and love for the earth. Indeed, a unique and truly outstanding feature of The Willow School's mission is its approach to the ecology of our environment. A core tenet of the school's guiding educational philosophy is that community – understood as the relationships between and among human beings as well as between human beings and the rest of the natural world – operates as both the source and ultimate point of acquiring knowledge. That is to say, education is necessary because we live in communities and must therefore know how to communicate and cooperate with one another; these skills enable us, in turn, to work toward making our communities healthier and more just. Our teachers thus seek to develop each student's intellectual, artistic, social, emotional, and physical potential, not as an end in itself, but in order to help him or her develop a mature understanding of how humans relate to one another and the natural environment. Students at all levels are encouraged to be aware of their natural surroundings and to take care of those surroundings by participating in them.

Several national organizations have cited the school's integrated commitment both to sustainable building design and to a K-8 curriculum informed by sustainability as a replicable model for reforming elementary and secondary education, both private and public. Spurred on by the United Nations' declaration that we have now entered the decade

of "education for sustainable development," the National Association of Independent Schools (NAIS), recently determined to pursue a bold new initiative in education for sustainability. Introduced at its 2004 annual conference in Montreal, this initiative served as the main theme of the 2005 conference in San Diego. At this conference, The Willow School was described to the more than 5,000 attendees as "*the* prototype school other institutions will need to follow in order to accomplish the tasks of the 21st century and beyond." The National Geographic's "Green Guide" ranked The Willow School as the nation's second greenest school for its progressive integration of sustainable design initiatives into the campus and the curriculum and the Travel Channel's Show, "Extreme Green" recognized The Willow School as the most eco-friendly school in the continental United States.

The Willow School seeks to develop each child's intellectual, artistic, social, emotional, and physical potential through a comprehensive interdisciplinary curriculum. Children's natural intellectual curiosity is fostered as they acquire the skills, knowledge, and analytic tools needed for advanced levels of thinking and reasoning. This project of educating the whole person also encompasses forming in our students the "habits of the heart" that enable them to live virtuously, to work toward making their communities healthier and more just, to consider and appreciate the beauty and wonders of nature, and to relate to their natural environment as stewards rather than conquerors.

It is thus clear that the work being done at our school, even at this early stage of its life, is already generating significant benefits – not only for the students, parents, faculty and staff of The Willow School and our neighbors in the region, but for schools and communities throughout the United States. We are justifiably proud of our accomplishments thus far and take quite seriously our self-appointed charge to serve as a true model and a "green beacon" of a sustainable future for K-8 education.

Submitted by: Kate Burke Walsh,
Head of School
The Willow School
March 20, 2012

GreenRibbon

Nominating Authority's Certifications

The signature by the Nominating Authority on this page certifies that each of the statements below concerning the school's eligibility and compliance with the following requirements is true and correct.

1. The school has some configuration that includes one or more of grades K-12. (Schools on the same campus with one principal, even a K-12 school, must apply as an entire school.)

2. The school achieves or is one of those overseen by the Nominating Authority which comes the closest to achieving the goals of all three green Ribbon Pillars:
   1) environmental impact and energy efficiency; 2) healthy school environments; and 3) environmental and sustainability education.

3. The Nominating Authority has evaluated the school and selected it for submission to the U.S. Department of Education from among those schools overseen by the Nominating Authority which have applied for a Green Ribbon, based on *documented achievement* toward the three Green School Pillars and Elements.

4. The school meets all applicable federal civil rights and federal, state, tribal and local health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

Name of Nominating Agency New Jersey Department of Education

Name of Nominating Authority Deputy Commissioner Andrew Smarick

(Specify: Ms., Miss, Mrs., Dr., Mr., Other)

I have reviewed the information in this application, including the award and eligibility requirements on pages 2-4, and certify, to the best of my knowledge through a documentary verification assessment, that the school meets the provisions in this Part of the Nominee Presentation Form.

(Nominating Authority's Signature) Date 3/21/12

Willow School - Private - 03	New Jersey 2012 Green Ribbon Schools Scoring Matrix			Total >	84.5
School Profile:	**Green School Programs and Awards 10%**			Score	Comments
Cross Cutting Descriptors	**1 pt.**	**2 to 3 pts.**	**4 to 5 pts.**		
Participation in green school programs and/or progress toward a BOE approved green strategic plan (current) **Maximum score = 5 points**	School participates in one program that benchmarks progress. i.e. Eco-Schools, GSLI, PLT Green School, NJPALS, Cloud Institute	School participates in a few programs that benchmarks progress. i.e. Eco-Schools, GSLI, PLT Green School, NJPALS, Cloud Institute	School participates in a number of programs that benchmarks progress. i.e. Eco-Schools, GSLI, PLT Green School, NJPALS, Cloud Institute, and a BOE approved green strategic plan	3.50	
Awards for environmental and sustainability efforts previously received **Maximum score = 5 points**	School has received one award for environmental and sustainability efforts. i.e. NJ DEP Recycling Award, Eco-Schools, PLT Green School!	School has received a few awards for environmental and sustainability efforts. NJ DEP Recycling Award, Eco-Schools, PLT Green School!	School has received numerous awards for environmental and sustainability efforts. i.e. NJ DEP Recycling Award, Eco-Schools, PLT Green School!	5.00	
Pillar I:	**Environmental impact and energy efficiency 30%**				
on, water, waste, and hazardous waste impacts					
Element Descriptors	**1 to 5 pts.**	**6 to 10 pts.**	**11 to 15 pts.**		
Element IA: Zero greenhouse gas (GHG) emissions - Improved energy conservation/energy-efficient building **Maximum score = 15 points**	School demonstrates some reduced energy use	School has an Energy Star rating and an Energy Master Plan; demonstrates substantial reductions in electricity, heating, energy use and carbon footprint; generates or purchases some renewable energy; has green building recognition for some new, renovated and/or existing buildings at minimum Silver level or equivalent; measures and offsets some of its remaining carbon footprint.	School has an Energy Master Plan; is Energy Star rated above 90; demonstrates reductions from baseline in electricity, heating and carbon footprint of 35% or more; >50% of energy use comes from renewable sources; offsets a *substantial* amount of its remaining footprint; has received green building recognition at the Gold or higher for all new, renovated, and existing buildings.	13.83	
Element Descriptors	**1 pt.**	**2 to 3 pts.**	**4 to 5 pts.**		
Element IB: Improved water quality, efficiency, and conservation i.e.. Water, Grounds **Maximum score = 5 points**	The school protects its water from contaminants; cleans its drinking water fountains and controls lead in drinking water.	In addition, the school has smart irrigation and landscaping that is water-efficient; conducts annual water audits and controls leaks; installs *some* water-conserving fixtures and/or appliances (e.g. waterless urinals, dual-flush toilets, appliances); and can demonstrate a *modest* amount of reduction in water-use compared to baseline.	In addition, the school demonstrates a *substantial* amount of reduction in water-use compared to baseline; uses *only* alternative water sources for irrigation (e.g. gray water; rainwater harvesting); provides *only* water-efficient fixtures; and uses other creative measures for protecting and conserving water at the school site (e.g. bioswales for controlling runoff).	4.50	

Element Descriptors	1 pt.	2 to 3 pts.	4 to 5 pts.		
Element IC: Reduced waste production and improved recycling and composting programs i.e. Waste, Hazardous waste **Maximum score = 5 points**	School monitors its hazardous waste and disposes of it as required by state law; has a recycling program that diverts 20% of its solid waste (but no organics/ compost); purchases some paper with *some* recycled content; uses *some* "third-party certified" cleaning products; and describes a few creative ways the school community practices the 4Rs.	In addition, school also has a pollution prevention approach to hazardous chemicals; recycles computer and electronics responsibly; purchases some electronics with E-PEAT certification; uses *substantial* amount of "third-party certified" cleaning products; has a recycling program that diverts 35% of its solid waste (some organics/ compost, such as yard waste); purchases *substantial* amounts of paper with recycled and chlorine-free content.	School also has made *substantial*, measured progress towards a "zero waste" goal; has a recycling program that diverts 50% or more of its solid waste (including organics like yard waste and food waste); purchases *substantial* amounts of paper with > 30% recycled content, and chlorine-free; has an environmentally-preferable purchasing policy and a hazardous waste management policy that reduces and prevents solid and hazardous wastes; uses 100% "third-party certified" cleaning products (not including disinfectants); has a custodial program that meets "green" institutional services standards; and describes several creative ways the school community practices the 4Rs.	4.17	
Element Descriptors	**1 pt.**	**2 to 3 pts.**	**4 to 5 pts.**		
Element ID: Use of alternative transportation to, during, and from school **Maximum score = 5 points**	School has programs in place to promote more efficient and healthier transportation, including designated carpool stalls, anti-idling policy, no loading/unloading near air intakes; has some percentage of students that do not drive in a single vehicle to school, and has some means of connecting students to the schoolyard.	In addition, school has a high percentage of students that do not drive in a single vehicle to school; participates in Safe Routes to Schools and identifies safe pedestrian routes; adopts a policy to promote active transportation; and has several means of connecting students to the schoolyard.	In addition, school has alternative-fuel buses and other creative means of promoting alternative transportation.	2.33	

Pillar II: **Healthy School Environments – 30%**

the health and performance of students and staff

Element Descriptors	1 to 5 pts.	6 to 10 pts.	11 to 15 pts.		
Element 2A: An integrated school environmental health program i.e. Integrated Pest Management, Ventilation, Contaminant controls, Asthma control, Indoor air quality, Moisture control, Chemical management **Maximum = 15 points**	School complies with all relevant state laws related to pesticides, mercury, tobacco and other hazardous materials; ensures good ventilation; keeps relative humidity below 60%;contains no mold; has CO alarms and inventory of appliances; complies with radon laws.	In addition, school tests classrooms for radon within last 24 months; implements an Integrated Pest Management plan that eliminates pesticides; implements an Indoor Air Quality Program equivalent to Tools for Schools; uses "third-party certified" cleaning products; actively manages chemicals; and describes other measures of student and staff health and safety.	School has completed everything in this section and uses an aggressive approach to eliminating environmental health and safety hazards (physical, biological, chemical, natural).	11.00	

Element Descriptors	1 to 5 pts.	6 to 10 pts.	11 to 15 pts.		
Element 2B: High standards of nutrition, fitness, and quantity of quality outdoor time i.e. Fitness and outdoor time, Food and Nutrition , Ultra Violet (UV) safety, Health Services, School Climate and Safety **Maximum = 15 points**	School conducts at least an average of 120 minutes per week per student of physical education with a reasonable amount conducted outdoors; has an on-site food garden; and participates in some nutrition program.	School also participates in a farm-to-school program; participates in USDA or other nutrition program at a high level; students participate in Sunwise-type program; *some* food purchased is certified organic; food from school garden is eaten by students.	School also purchases a *substantial amount of* food certified organic; reduced UV and heat exposure; more than 50% of physical education annually takes place outdoors; and undertakes other measures to promote healthy nutrition, and high quality outdoor time.	12.17	

Pillar III: Environmental and Sustainability Education – 30%

duates are environmentally and sustainability literate

Element Descriptors	1 to 3 pts.	4 to 6 pts.	7 to 10 pts.		
Element 3A: Interdisciplinary learning about the key relationships between dynamic environmental, energy and human systems **Maximum = 10 points**	School integrates E/S concepts into many subjects; integrates E/S into some class and school assessments; >50% of teachers participate in occasional E/S professional development opportunities; enrolls at least 5% of the school's eligible graduates in AP environmental science during their high school career.	School focuses E/S literacy efforts on understanding the key relationships between dynamic environmental, social, and economic systems; incorporates *E/S* themes and topics in many grades, subjects, classroom and school assessments; >75% of teachers participate in one or more E/S professional development opportunities annually.	School has an E/S graduation/ matriculation requirement which is focused on understanding the key relationships between dynamic environmental, social, and economic systems; fully integrated E/S into the curricula scope and sequence of learning and matriculation standards for *all* grades; enrolls >5% of the school's eligible graduates in AP environmental science during their high school career.	9.67	
Element Descriptors	**1 to 3 pts.**	**4 to 6 pts.**	**7 to 10 pts.**		
Element 3B: Use of the environment and sustainability (E/S) to develop Science, Technology, Engineering, and Mathematics (STEM) content, knowledge, and thinking skills to prepare graduates for 21st century technology-driven economy **Maximum = 10 points**	School r*arely* integrates E/S into science courses; makes *few* connections to E/S careers; and provides *little* evidence about links to STEM.	School *sometimes* integrates E/S into science courses; makes *some* connections to E/S careers; and provides *some* additional evidence about links to STEM.	School *frequently* integrates E/S concepts into STEM courses; curricula makes *many* connections throughout to E/S careers, career tech/green jobs; offers E/S related CTE courses; and provides a substantial amount of additional evidence about links to STEM education.	8.33	
Element Descriptors	**1 to 3 pts.**	**4 to 6 pts.**	**7 to 10 pts.**		
Element IIIC: Development and application of civic engagement knowledge and skills **Maximum = 10 points**	School has civic projects related to environment and sustainability in *some* grades; occasional meaningful outdoor learning experiences in a *few* grades; and a *few* community partnerships, perhaps only involving donations of funds/supplies.	In addition, school employs best practices for inquiry-based, hands-on, experiential learning in both their civic and outdoor experiences; projects are not "one-off" but instead are in-depth service learning and civic projects fully integrated with school's academic coursework.	School receives full credit when *all* grades have civic projects; when *all* grades have meaningful outdoor learning experiences; and when the *quality* and *quantity* of community partnerships *results* in sustainability advances at the *school, other schools and the wider community*. Higher points for inspiring and creative projects and partnerships.	10.00	

New Jersey Green Ribbon Schools Application

School Contact Information

School Name: The Willow School Street

Address: 1150 Pottersville Road City:

Gladstone

State: New Jersey

Zip: 07934

School Website: www.willowschool.org

Principal

First Name: Kate

Last Name: Burke Walsh

Email Address: kwalsh@willowschool.org

Phone Number: 908 470 9500 x1010

Lead Applicant (if different from principal)

First Name: Casey

Last Name: Cullen

Title: Sustainability Coordinator Email:

ccullen@willowschool.org Phone

Number: 908 470 9500 x1025

Level
[ ] Elementary (PK - 5 or 6) [

X] K - 8

[ ] Middle (6 - 8 or 9) [

] High (9 or 10 - 12) [ ]

Other (state)

School Type
[ ] Public

[X] Private/Independent

District and Code - (i.e. Aberdeen School District – 14005)

District Name: Not Applicable Code --

SCHOOL PROFILE: GREEN SCHOOL PROGRAM AND AWARDS

Is your school participating in a local, state, or nationally recognized green school program? If yes, please explain what program and what level you are currently at (for example, local Green Strategic Plan, Eco Schools USA, PLT Green Schools, NJPALS, Green Schools Leadership Institute, Cloud Institute, NJ Sustainable Schools Project).

Yes, we are members of the: National Wildlife Federation Eco Schools program, the Cloud Institute, and the NAIS Sustainable Schools initiative.

Has your school has received any green school, environmental, healthy school, environmental education, or sustainability education awards? If yes, please describe them, and state the year in which they were received:

Willow has been recognized in Smart School's Ecoliteracy Book, and awarded recognition and grants by the Council for Spiritual and Ethical Education (2009-2011), in addition to the awards below.

In November 2009, The Willow School received the New Jersey Department of Environmental Protection's Stewardship Initiative, which recognized the school for its voluntary and proactive measures taken to go beyond compliance in an effort to improve the environment and help ensure a sustainable future.

In March 2010, The United States Department of Environmental Protection, Region 2, selected The Willow School to receive the 2010 U.S. EPA Environmental Quality Award for our outstanding commitment for protecting and enhancing environmental quality and public health. The Environmental Quality Award is the highest recognition presented to the public by the EPA.

In April 2010, New Jersey Monthly's issue, "Best of New Jersey", an article entitled, "Best of the Best", chose The Willow School as "the most significant architectural project of the past decade", citing how the building, site and field studies programs are integral parts of the daily curriculum.

In the October 2010 issue of New Jersey Life, in an article entitled "Natural Virtues", The Willow School was described as a school that has "become a national model of excellence in education and sustainable design." And finally, in the Friday 8 October 2010 issue, Reuters, in an article entitled "The Sun Rises on Green Schools" reported that "Green schools are more than just efficient buildings; they are incubators for tomorrow's green leaders, which has been readily demonstrated at model green schools such as The Willow School in New Jersey.

Has your School Board adopted a Green Strategic Plan? ***Yes_x*** *We have sustainability goals in our current strategic plan. Our Strategic Plan has a chapter titled 'Education for Sustainability' that describes our goals and steps to do the following:*

1. *Work towards a zero-waste campus which eliminates the very concept of waste a. Analyze current waste systems and conduct a feasibility study*
   b. *Create and maintain systems that minimize waste and use only materials that can be composted on-site or recycled*
   c. *Incorporate these systems into our curriculum*
   d. *Promote an awareness that ecological thinking is a catalyst for ethical behavior*
2. *Develop and promote The Willow School as a resource center for regenerative design and sustainable culture*
   a. *Continue to design future buildings and landscapes to be regenerative and instructive*
   b. *Create a new website that illustrates how the Willow School is a community resource for regenerative design*
   c. *Organize and develop programs that increase the school community's knowledge of education for sustainability and regeneration of place*
3. *Enhance and maintain a national leadership position in the development of educational programs on sustainability and regeneration of place as a living system*
   a. *Continue to provide professional development for teachers and staff*
   b. *Provide support for teachers to collaborate and develop curriculum to solidify the student's understanding of economic, ecological, and cultural sustainability*

c. *Promote The Willow School's reputation as a place of strong academic and environmental curriculum*

Has your school created a Green Team? *Yes_X_* If *yes*, describe its composition.
There is a student lead Green Guide program that provides information about the school's "green" aspects through educational programs outreach, and tours for the greater community.

Has your school seen a cost savings from green initiatives? *Yes_x__*
If yes, describe the savings - *Energy savings is one of the major cost savings the school has realized from it's investment in sustainable design strategies: The building's site orientation and layout plan along with super insulated walls and ceilings, high performance windows, high efficiency heating and cooling systems, innovative day lighting strategies which include automatic photocell based daylight dimming controls for interior light systems, all provide maximum energy performance. The use of radiant in floor heat and a hybrid economizer heating/cooling system, which shuts down all heating and cooling when the outside temperature is between 65 degrees and 80 degrees, significantly reduces energy loads. The buildings use high efficiency motors, pumps and heating/cooling systems along with variable air volume air conditioning, thus reducing air supply when it is unneeded. Ceiling fans are provided to most rooms to save on air conditioning and a total heat recovery system is utilized to capture heat from exhaust air that would otherwise have been wasted. The Barn, our multiuse building certified LEED Platinum, consumes 70% less energy compared to an identical building constructed to building code. Photovoltaic on site renewable energy generation provides 37% of the buildings' electricity requirements.*

Also, water reduction techniques such as using collected rainwater to flush all our toilets, low flow water faucets and fixtures, and native/drought resistant landscaping which requires no irrigation all reduce our water costs. Additional savings have come from printing and ink saving policy initiatives and recycling programs that reduce landfill trash disposal costs. Reducing our internal printed correspondence and switching school printed materials to electronic messages has reduced our printing/paper costs.

PILLAR 1: <u>ENVIRONMENT IMPACT AND ENERGY EFFICIENCY</u>
Buildings, ground and operations: The school has made significant progress toward net zero environmental impact (zero carbon, solid waste, and hazardous waste footprints.)

Element 1A: Zero greenhouse gas (GHG) emissions

ENERGY

1A1. Using the inventory module from Clean Air Cool Planet's Campus Carbon Calculator or similar green house gas calculator, what is your school's GHG emissions per person?

Approx. 2.15 MT eCO2/person for 2011. We divided the total carbon emissions, 347.9 MT eCO2, by the total number of staff, faculty and fulltime students plus counting summer students as ½.

1A2. Has your school received EPA ENERGY STAR certification? *No_x partners in 2009.*
But we did become energy star partners in 2009.

Has your school reduced it total non-transportation energy use from an initial baseline? **Yes**
While this has not been an outright goal for the Willow School because the original design of our buildings and curriculum intended for the lowest possible energy use, as LEED Gold/Platinum certified buildings, we do know that they perform well below conventional, similar size buildings.

Using ASHRAE 90.1-1999 Standards as a benchmark (the benchmark provided by LEED), our school house reduced building energy use by 58% and our art barn reduced energy use by 70%.

1A3. Has your school conducted an energy audit of its facilities? *No_x_*
1A4. What percentage of your energy consumption is derived from the following: (this includes BTU's/energy from Geothermal and bio-fuels or electricity from solar, wind and fuel cells).

On-site renewable energy generation: *17% of our total campus energy consumption*

Purchased renewable energy: *100% (of all power pulled from grid)*

Natural Gas: *21.9% for 2010 to 2011 school year*

Please indicate which energy saving practices have been implemented at your school:
[X] School has automatic light sensors in all regularly occupied rooms or has a policy to turn off lights in all unoccupied rooms and use daylight when possible.
[ ] School policy requires all computers and other electronic equipment to be turned off at the end of the day.
****In process of being approved for new school year*
[X] School is inspected for potential energy waste on a regular basis (at lease annually) and issues are addressed promptly by maintenance staff.
[X] School sets standard heating and cooling points of 68 - 70 degrees during the heating season and no higher than 75 degrees for air conditioning.
[X] School has a programmable system or weekend and vacation shutdown procedures for its HVAC system.
[ ] Window blinds or curtains are shut at the end of the day to retain heat and opened in the morning to let in daylight.
[X] Windows and doors are closed when heating/cooling systems are on.
[X] School has developed and implemented a communication plan that includes print and electronic media for students, staff and parents regarding above practices.

Identify all additional energy efficiencies that are possible using potential energy reductions.
Our buildings are currently designed to be highly efficient, and our curriculum and practice on campus demands ethical behavior and understanding, which always includes the environment. Energy savings is one of the major cost savings the school has realized from it's investment in sustainable design strategies: The building's site orientation and layout plan along with super insulated walls and ceilings, high performance windows, high efficiency heating and cooling systems, innovative day lighting strategies which include automatic photocell based daylight dimming controls for interior light systems, all provide maximum energy performance. The use of radiant in floor heat and a hybrid economizer heating/cooling system, which shuts down all heating and cooling when the outside temperature is between 65 degrees and 80 degrees, significantly reduces energy loads. The buildings use high efficiency motors, pumps and heating/cooling systems along with variable air volume air conditioning, thus reducing air supply when it is unneeded. Ceiling fans are provided to most rooms to save on air conditioning and a total heat recovery system is utilized to capture heat from exhaust air that would otherwise have been wasted. The Barn, our multiuse building certified LEED Platinum, consumes 70% less energy compared to an identical building constructed to building code. Photovoltaic on site renewable energy generation provides 37% of the buildings' electricity requirements.

Of the efficiencies identified above, match those with any possible state and federal incentives to help defray the cost. *None that we are currently aware of.*

With each site being considered, identify possible renewable energy options and provide the potential reduction in energy usage. *There is always an opportunity to increase the size of our photovoltaic array to about 40 percent of our annual use which would amount to another 106,000 KWH- over $12,000 savings in utilities bills. This would reduce the impact we have on the central grid. The largest obstacle, however, with these solar arrays is upfront cost. Since our first two buildings are designed to such high environmental design standards, it is difficult to determine other possible reductions. Our buildings are a combination of strong building envelopes, thick insulation, natural ventilation, daylight harvesting, and energy efficient appliances. All of these were carefully and intentionally selected based on a detailed cost-benefit analysis when they were built and for the most part, less expensive and more efficient replacements have not been identified.*

Identify state and federal incentive programs available, and provide a cost payback analysis for each renewable being considered.
We have applied for rebates for our solar arrays with the Board of Public Utilities, these repaid about 60% of our panel costs.

BUILDINGS

1A5. Has your school constructed and/or renovated buildings in the past 10 years? *Yes_X_*

What percentage of the building area meets Leadership in Energy and Environmental Design (LEED) ? *100%*
In what year was your school constructed and/or renovated? *2003, 2007*
What is the total constructed area? *27,000 (SQ.FT.)*
What is the total renovated area? *1,000 (SQ.FT.)*
Which certification (if any) did you receive and at what level (e.g. Silver, Gold, Platinum) and in what year?
LEED Gold (lower school) in 2003, LEED Platinum (art barn) in 2007

1A6. Have the project plans been viewed from an Integrated Pest Management (IPM) point of view? *Yes_X*

Has IPM been considered before any new building project or renovation project (either buildings or grounds)?
Yes_X

1A7. What percentage of your school's total existing building area has achieved LEED Existing Buildings: Operation & Maintenance, CHPS Operations Report Card, Green Globes or other standards? *0%*

1A8. Does your school **reduce** or **offset** the GHG emissions from building energy use? *Yes_x __*
***The EPA ReTRAC tool provides the Metric Tons of GHG Reductions, we have provided those answers. This tool uses a combination of building operational data and location information to determine GHG reductions. These measure the GHG we offset in our operations to account for the emissions of our buildings energy use. We have not been able to quantify the building emissions yet- only our " offset" ***

Current Total GHG Reductions (MtCO2e) = *20.51*
Baseline Total GHG Reductions (MtCO2e) = *15.27 in 2009*
Change from Baseline: GHG Emissions (MtCO2e) = *5.24 from original baselin*
Time period: *from January 2011 to December 2011*

Please indicate which green building practices your school is using to ensure your building is energy efficient.
[ ] School has fully implemented the Facility Energy Assessment Matrix within EPA's Guidelines for Energy Management.
[ ] School Building has been assessed using the Federal Guiding Principles Checklist in Portfolio Manager. [x] School has an energy and water efficient product purchasing and procurement policy in place.
[x] Other- we have a Green Purchasing Policy

1A9. What percentage (by cost) of all your school's furniture purchases are certified under the Business and Institutional Furniture Manufacturers Association's "level" ecolabel? *see 1A11.2*

1A10. Does your school have an energy and water efficient product purchasing and procurement policy in place? *Yes_x__*

If yes, describe the policy that is in place. *The school has always believed in making intentional decisions in purchasing, but in early 2011, a green purchase policy was finally written out and became a requirement for any and all purchases on campus.*

1A11.1 Does your school purchase energy through ACES? (Alliance for Competitive Energy Services)
No__x_ But we do purchase REC's through a green-e certified supplier

1A11.2 Describe other indicators of your progress towards elimination of GHG emissions in detail and

include metrics if available): *Some of our school furniture was made from trees logged as a result of the construction of our two buildings, which reduces the GHG emissions associated with the transport, treatment, and manufacture of furniture. We have a detailed 10-year forest management program to ensure the highest quality of habitat and carbon sequestration possible on our site. We compost and recycle the highest quantity of material we possible can to avoid adding to landfill waste, and therefore, methane emissions- which we do not believe are captured for use at our specific plant. We purchase Renewable Energy Credits so the power we do pull from the grid is funding alternative energy projects nationwide, instead of supporting a coal and fossil fuel based economy. Nearly 40% of our total electric use, and 17% of our total energy use is derived from our on campus solar panels.*

Element 1B: Improved water quality, efficiency, and conservation

1B1. Can you demonstrate a reduction in your school's total water consumption (measured in gal/square foot) from an initial baseline? *Yes_x* Please provide:

Baseline provided by USGBC LEED 2006 (when last building was constructed): Toilets 2.5 gallons per flush, Urinals: 1.0 Gallons per flush, Faucets: 2.0 gpm at 60 psi, residential sinks 2.5 gpm

Our campus in total has 22 toilets, 2 Urinals, and 29 Faucets, 8 residential faucets
Baseline: 57 gpf and 88 gpm
22 toilets x 2.5 gpf = 55 gpf
2 Urinals x 1.0 gpf= 2.0 gpf
29 sinks x 2.0 gpm = 58 gpm
12 sinks x 2.5 gpm= 30 gpm

Actual Use: 35.8 gpf 59.4 gpm
20 Toilets x 1.6 gpf= 32 gpf
1 toilet x 1.28 gpf= 1.28 gpf
1 toilet x 2.5 gpf = 2.5 gpf
2 urinals x 0 gpf= 0 gpf
12 Faucets x 0.5gpm = 6 gpm
27 Faucets x 2.2 gpm = 48.4 gpm
3 faucets x 1.42 gpm = 4.26 gpm

Percentage reduction in domestic use: ***100% reduction in flush fixtures, because this is gray water NOT potable water and 32% reduction in flow fixtures***

Percentage reduction in irrigation: *we do not irrigate*

Which of the following practices does your school employee to increase water efficiency and ensure quality? (Please check all that apply)

[x] Our school conducts annual audits of the facility and irrigation systems to ensure they are free of significant water leaks and to identify opportunities for savings.
[ ] Our school has a smart irrigation system that adjusts watering time based on weather conditions.
[x] Our school's landscaping is water-efficient and/or regionally appropriate.
[x] Our school uses alternative water sources (ie. grey water) for irrigation before potable water.
[x] Our school has not been sited within the past three years for failure to meet federal, state or local potable water quality standards.
[ ] Taps, faucets, and fountains at our school are cleaned at least twice annually to reduce contamination and screens and aerators are cleaned at least annually to remove particulate lead deposits.
[ ] Our school has a program to control lead in drinking water (including voluntary testing and implementation of measures to reduce lead exposure) ****No, but city water does test*

1B2. How often does your school conduct audits of facilities and irrigation systems to ensure they are free of significant water leaks and to identify opportunities for savings? *Weekly*

1B3. Describe how your school's site grading and irrigation system and schedule is appropriate for your climate, soil conditions, plant materials, and climate, with an emphasis on water conservation:

We do not have an installed irrigation system, we use native and adapted plantings that like the New Jersey climate and do not require re-planting, constant watering, etc. The only space we water is our classroom vegetable garden space using manual and monitored sprinklers using recycled rainwater.

1B3.1 Has your school sought advice from Cooperative Extension for irrigation efforts. *_x_ not needed*

1B4. Do all your outdoor landscapes consist of water-efficient or regionally appropriate (native species and /or adapted species) plant choices? *Yes__X_*

Our landscape consists of New Jersey native grasses, perennials and shrubs such as: Hostas, turtleheads, willow trees, chestnut trees, maple trees, rudbeckia, Eastern redbuds, summersweet clethera, crabapple trees, blackhaw viburnum, dogwood trees, blueberries, sambucus Canadensis, purple asters, Echinacea magnus, American elder, sweet gum trees, staghorn sumac, sassafrass trees, eragostis spectabilis, 'shamrock' bushes, callicarpa Americana, autumn bride, veronia noveboracensis, boltonia asteroids, eupatorium dubium, penstemon digitalis, amelanchier trees, oenothera, 'fireworks' grasses, and purple irises. Some of these plants have been fostered in their original locations, others have been planted according to their water and sunlight demands. Many water-happy plants are near our constructed wetland. The property is also managed to remove invasives and ensure the survival of native species.

1B5. Are alternative water sources (e.g., grey water) used before potable water for irrigation? No _X___
We do not irrigate our main landscape, but graywater is used for some manual watering for our classroom vegetable garden.

1B6. If drinking water is acquired from the school's own well, are your drinking water sources protected from potential contaminants?: *N/A*

1B7. Does your school have a program to control lead in drinking water (including voluntary testing and implementation of measures to reduce lead exposure in drinking water) in place?
No__x_ While we do not have an active program, we use no lead piping or sodder in our buildings. Additionally, we use only city water for potable uses, which is tested daily as per regulation.

1B8. Has your school been cited within the past three years for failure to meet federal, state or local potable water quality standards? *No_X__*

1B9. Are all taps, faucets and fountains used for drinking and cooking cleaned on a regular basis to reduce possible bacterial and other contamination; and are faucet screens and aerators regularly cleaned to remove particulate lead deposits? *Yes_X_* If yes, how often is such cleaning conducted? *Weekly cleanings performed for bacterial and other contaminations.*

1B10: Describe any other ways, not addressed above, that the school is improving water quality, efficiency, and conservation: *Water conservation is an essential sustainable design component at The Willow School. This includes harvesting rainwater that falls on the 85% recycled stainless steel roof and using it to flush toilets in the building, thus reducing storm water run off and preserving potable water for human drinking needs. The building also utilizes a "constructed wetland" innovative wastewater management system, where plants are grown hydroponically in septic water. This septic water is treated and cleaned to recreational quality standards in the plant bed before it is returned to the ground. This promotes local ground water recharge, reduces the burden on the municipal sewage system, and reduces energy usage. Low flow toilets, automatic faucet sensors, faucet and showerhead flow restrictors, along with waterless urinals also help reduce the use of potable water. Finally, the campus's drought tolerant native grass and perennial landscape requires no landscape irrigation The buildings use approximately 58% less potable water than a conventional building constructed to code.*

Describe any financial savings from water conservation methods or technologies that your school has installed: *We have saved costs by not sending all our gallons of septic water to be treated by the city and*

by using captured rainwater for nonpotable school uses.

Describe any local resources or experts that you consulted that helped improve the overall water efficiency and quality of the water in your school.

Natural Systems International, Biohabitats Inc., and Back to Nature have all been consultants and contractors helping us choose the most suitable landscape design and plantings for our site in addition to designing a landscape that will capture all of our stormwater on site.

GROUNDS

1B11. What percentage of your school grounds (e.g., playgrounds, rain gardens, outdoor spaces designed and used regularly for social interaction, athletic or recreational areas, etc.) are devoted to ecologically or socially beneficial uses, including those that give consideration to native wildlife? *100% We have a wide variety of land uses on our campus, we have gardens, open space, forested space, playground and turf soccer field. Our students and/or native wildlife utilize all of these spaces. Wildlife can thrive due to our water-minded landscaping and native or adapted plantings and forestry management program. Additionally, we have an IPM program, which demands minimal pesticides.*

1B12. Have you diverted rainwater that falls on impervious surfaces (roof, parking lot) from the city storm sewers to on-site management areas such as rain gardens, swales, or ponds? *Yes_X_* If yes, describe how:
A primary focus of the landscape plan is to dramatically reduce storm water runoff from moving off the site and encourage local ground water recharge. This is accomplished by: planting deep -rooted native grasses and perennials in lieu of traditional turf grass; minimizing the width of paved surfaces and hardscape to reduce impervious surfaces; reducing the use of roadway curbing, concrete catch basins and underground piping by employing vegetated bio-swales and rain gardens, planted with filtering plant species; and capturing roof rainwater runoff in underground storage tanks and using it to flush toilets in the building.

Element 1C: Reduced waste production

WASTE

1C1. What percentage of waste is diverted from the landfill or incinerator by reuse, composting, and/or recycling:
Monthly garbage volume (garbage dumpster size(s) X frequency of collection): *792.22 pounds*
Monthly recycling volume(s) (recycling dumpster sizes(s) X frequency of collection): *808.19 pounds*
Monthly compostable materials volume(s) (food scrap/food soiled paper dumpster size(s) X frequency of collection: *283.33 pounds.*
Recycling rate calculation: Total monthly recycling quantity, plus total monthly compostable material quantity divided by total monthly recycling, composting, and garbage quantity x 100 = *57.94%*

1C2. What percentage of total office/classroom paper content <u>by cost</u> is post-consumer material or fiber from forests certified as responsibly managed by the Forest Stewardship Council, Sustainable Forestry Initiative, American Tree Farm System or other certification standard: *60%*

Which standard did you use?

We use 2 grades of office and classroom paper. 100% recycled for the majority of our copying and 30% recycled for detailed color copying, where the printing color quality can be compromised by the higher recycled content.

1C3. What percentage of total office/classroom paper content <u>by cost</u> is "totally chlorine-free" (TCF) or "processed-chlorine-free" (PCF)? *39%- all of our office paper is processed chlorine free. For FY 2011, our office paper expense was about $4840, and our total office supply budget was $12,500*

1C4. Describe the steps taken to replace paper instruction with paperless, (working and reviewing online, white boards, flash cards, etc).

Our weekly newsletter is digitally dispersed and announcements for school closings/holidays/events, and all student report cards are all online. We are in process of putting all brochures and advertisements online. We have provided several teachers with whiteboards and our middle school often assigns and accepts homework via email.

Describe the amount of paper per student saved.
While we are certain we are saving paper, we feel this is a difficult number to determine at this time.

1C5. Does your school refill or recycle printer cartridges? *Yes_X_ We additionally eliminated individual printers throughout the school and converted to a more ink and energy efficient, master printer.*

1C6. Does your school use durable plates, trays, and tableware? *Yes_x_*
If your school composts on site, do you use compostable tableware instead of plastic? *Yes_x_*

Which of the following practices does your school employ to reduce waste?
[x] Our school has a program in place to promote waste reduction practices (for example, reduced paper use, use of durable products).
[x] Our school has implemented policies to reduce the amount of ink used in printing (for example, toner saver features, preferred font selections).

[x] Our school does not sell bottled water.

[x] Our school has installed a hydration station and/or conducted a campaign to promote use of reusable water bottles.

[x] Our school has reduced or eliminated Styrofoam and other disposable trays and utensils in our lunchroom. ** *By policy and practice, we have never used Styrofoam on our campus*

[x] Our school actively involves students and staff in our waste reduction and recycling practices.

Hazardous Waste

1C7. How much hazardous waste does your school generate? *0 lbs/student/year*

How was this calculated? *The school does not purchase or use toxic or hazardous materials, so there are none to produce waste.*

1C8. How does your school monitor hazardous waste? *N/A*
1C9. Is a Hazardous Waste Policy for storage, management and disposal of chemicals in laboratories and other areas with hazardous waste in place and actively enforced? *N/A*

1C10. Has your school been cited within three years for improper management of hazardous waste according to Federal and State regulations? *No_x____*
1C11. What percentage of total computer purchases by cost are Electronic Product Environmental Assessment Tool (EPEAT) certified products: *0%*

How does your school dispose of unwanted computer and other electronic products?
Electronic recycling program or donation

1C11.1 Describe how your school manages spent fluorescent lamps (light bulbs).
We have a campus collection site in our administration building, when the boxes are full, they are recycled.

1C12. Our custodial program has been certified by the ISSA Cleaning Industry Management Standard - Green Building (or other equivalent standard). *No_x_*

1C13. What percentage by cost, of all cleaning products in use, are "third party certified" green cleaning products? *100%*

Which standard(s) are you using? *Green Seal Certification, Design For Environment*

Element 1D: Use of alternative transportation to, during and from school

1D1. What percentage of students walk, bike, bus, or carpool (2+ students in the car) to/from school? *49%*

Describe how this information been collected and calculated: *Verbal Interview with staff doing drop off daily. We went through a list of families at the school, and noted each car that brings 2 or more students daily.*

1D2. Does your school have a no-idling policy on file and signs posted stating that all vehicles, including school buses and other vehicles dropping off and picking up students, are prohibited from idling on school premises? *Yes__x__*

Describe how you are complying with the NJ no idling law.
We state that there is to be no idling while on our campus during student drop-off or pick up

1D3. Are all vehicles loading & unloading areas at least 25 feet away from all buildings air intakes (including doors and windows)? *No__x__*

1D4. Describe how your school transportation use is efficient and environmentally benign (e.g. the percentage of school-owned electric/hybrid/alternative fuel vehicles in your fleet, or other indicators of significant reductions in emissions): *we have no school vehicles*

1D5. Have "Safe Pedestrian Routes" to school or "Safe Routes to School" been designated, distributed to parents and posted in the main office? *No_x_, students are not able to walk to school*

1E1. Describe any other accomplishments your school has made under Pillar 1 towards eliminating its negative environmental impact or improving your environmental footprint, which you feel, should be considered: *In addition to a strong composting and recycling program, we participate in an upcycling fundraiser with Terracycle. The third graders join brigades that collect items like spent cell phones, Capri sun wrappers, yogurt cups, and other non-recyclables and fill up copy boxes with them. Then they print out shipping labels and send them to Trenton, where they receive a few cents for each item they collected. This not only diverts waste from a landfill, but also saves enormous amounts of energy because many items are simply washed and made into something new- whereas recycling is extremely energy intensive.*

1E2. Describe what leadership decisions have been made and what partnerships have established related to Pillar 1: *Our Community partners often change as the passions and interests our students have change. We have partnered with Aveda cosmetics and collected hundreds of pounds our bottle caps with our kindergarteners to be melted down and made into containers for Aveda products. We also consistently partner with the Upper Raritan Watershed Association, the New Jersey Conservation Association, and the University of Vermont- Rubenstein School of Environment and Natural Resources.*

PILLAR 2 : <u>HEALTHY SCHOOL ENVIRONMENTS</u>

Element 2A: An integrated school environmental health program based on an operations and facility-wide environmental management system that considers student and staff health and safety in all practices related to design, construction, renovation, operations, and maintenance of schools and grounds.

Integrated Pest Management

2A1. Does your school provide notification of your pest control policies, methods of application and requirements for posting and pre-notification to parents and school employees? *Yes_x_*

2A2. Does your school maintain annual summaries of pesticide applications, copies of pesticide labels, copies of notices and MSDSs in an accessible location? *Yes_x_*

2A3. Does your school prohibit children from entering the pesticide area for at least 8 hours following the application or longer, if feasible, or if required by the pesticide label? *Yes_x_*

Ventilation

2A4. Does your school meet the stricter standard of: ASHRAE Standard 62.1-2010 (Ventilation for Acceptable Indoor Air Quality) OR your state or local code? *Yes_x_ ASHRAE as required by LEED*

2A5. Are local exhaust systems (including dust collection systems, paint booths, and/or fume hoods) installed at all major airborne contaminant sources, including science labs, copy/printing facilities, and chemical storage rooms? *No_x_ Not above our copiers*

2A6. Has your school installed energy recovery ventilation systems where feasible to bring in fresh air while recovering the heating or cooling from the conditioned air? *Yes__x__*

Contaminant Controls

2A7. Radon: Have all ground-contact classrooms been tested for radon within the past 24 months? *No_x_ Not required because of high rates of natural ventilation in our buildings.*

2A8. Carbon Monoxide (CO): If your school has combustion appliances, does your school have an inventory of all combustion appliances and does your school annually inspect these appliances to ensure no release of Carbon Monoxide (CO*)??* *No__x_____*

Are CO alarms installed which meet the requirements of the National Fire Protection Association code 720? *No_x__ **We have identified 3 possible sources. These will be installed by June 30th*

2A9. Mercury: Have all unnecessary mercury-containing devices been replaced with non-mercury devices, including florescent light bulbs? *Yes_x__*

Does your school recycle or dispose of unwanted mercury laboratory chemicals, mercury thermometers, gauges and other devices in accordance with federal, state and local environmental regulations: *Yes __x_*

2A10. Chromated Copper Arsenate (CCA): Have all wooden decks, stairs, playground equipment or other structures treated with Chromated Copper Arsenate been either removed or sealed within the past 12 months? *Yes_x__*

2A11. Secondhand Tobacco Smoke: Is smoking prohibited on campus and school buses? *Yes_X_*

2A12. Asthma Control: Does your school have an asthma management program in place consistent with the National Asthma Education and Prevention Program's (NAEPP) Asthma Friendly Schools Guidelines? *In process __x___*

2A13. Indoor Air quality: Have you developed and implemented a comprehensive indoor air quality management program consistent with IAQ Tools for Schools*?* *No_x_ ** We are in process of adapting our system to be documented as well as the IAQ Tools for Schools system.*

2A14. Moisture Control: Are all structures visually inspected on a regular basis and free of mold, moisture & water leakage? *Yes__x__*

Is indoor relative humidity maintained below 60% (cold climates during freezing temperatures should target 20-30%)? *Yes__x__*

Are moisture resistant materials/protective systems installed (e.g., flooring, tub/shower, backing, and piping)? *Yes___x_*

2A15. Chemical Management: Does your school have a chemical management program in place that includes the following elements:

[x] Routine removal of materials no longer needed for the curriculum, by disposal or donation

[x] Chemical purchasing policy, including low- or no-VOC products
[x] Chemical inventory
[ ] Storage and labeling
[ ] Training and handling
[ ] Hazard communication
[x] Spills, clean up and disposal
[ ] Select EPA's Design for the Environment - approved cleaning products
[x] Pesticides
Yes_x__
Explain: *Our curriculum does not call for hazardous chemicals in science or maintenance, we do hold MSDSs for all products and choose the most cost effective and healthy cleaning products we can find.*

Air Quality - Boilers, Heaters, Emergency Generators, Dust Collectors, Spray Booths, and Parts Washers

2A16. Boilers, Heaters, Emergency Generators, Dust Collectors, Spray Booths, and Parts Washers are sources of air pollution that may require a NJDEP air permit.

Check here http://www.state.nj.us/dep/aqm/Sub8.pdf (section 8.2) to determine if you are required to obtain a NJDEP air permit for equipment at your school.

Does your school(s) have any equipment described above that requires an air permit?
Yes__x__
No___

If Yes, have you obtained the required NJDEP air permit(s)?
No___x__
In *process*
For older permits (> 10 years), NJDEP recommends obtaining a new air permit**.** See *3 below.

Fuel burning equipment (Boilers and Heaters): See *1 below

Does your school(s) have any Boilers and/or heaters? *Yes_x_*

If yes then: Are they permitted with NJDEP? *Yes_x__*
For older permits (> 10 years), NJDEP recommends obtaining a new air permit See *3 below.

Are any of these boilers/heaters certified to be energy efficient (energy star, etc.)? **Yes X** If yes, then describe: *Energy Star Rated*

Are any of these boilers/heaters equipped with air pollution controls (low NOx burners, particulate filters, etc.) to reduce air emissions? ***Yes__x_*** If yes, then describe: *There are no filters due to the high efficiency of equipment. We do have low NOx burners.*

Do any of these boilers/heaters require annual combustion adjustments to reduce air emissions? See *4
Yes____**No_*X*** *We do semi annual maintenance on all boiler equipment to ensure maximum efficiency*

2A17. Fuel burning equipment (Emergency Generators): See *1 below.

Does your school(s) have any Emergency Generators? *Yes_x_*
If yes then: Are they permitted with NJDEP? *No_x__*
****in process*
For older permits (> 10 years), NJDEP recommends obtaining a new air permit. See *3 below.

Do you have any Emergency Generators equipped with air pollution control equipment (catalytic converters, particulate filters, etc.) to reduce air emissions? *No__x __*

Are you aware of the recordkeeping requirements required by NJDEP? *Yes__x_*

Are you aware that you cannot operate Emergency Generators for testing and maintenance on days when the Department has forecasted a "bad air" day? *Yes_x__*

2A18. Storage Tanks:
Does your school(s) have any storage tanks containing VOCs (gasoline, etc.)? *Yes __x__*
If yes then: Are they permitted with NJDEP? See *2 below. *N/A_x__*
For older permits (> 10 years), NJDEP recommends obtaining a new air permit. See *3 below.

Element 2B: High standards of nutrition, fitness, and quantity of quality outdoor time for both students and staff

Food and Nutrition

2B1. Has your school earned USDA's Healthier US School Challenge award for school food? *No_x____*

2B2. What percentage (by cost) of food purchased is certified as "environmentally preferable" (e.g. Organic, FairTrade, Food Alliance, Rainforest Alliance, etc.)? *About 70%*

2B3. What percentage (by cost) of food purchased is grown and processed within 200 miles of the school or what percentage is grown and processed with "geographic preference" in mind? *About 60%*

What percentage of food is grown on school grounds? *1%*
What percentage of food is grown organically? *30%*

2B4. Does the school have an "onsite school garden" that students participate? *Yes_x __*
If yes, does the school garden supply food for the school cafeteria?*__Yes_x*

2B4.1 Describe how the onsite school garden is used as a teaching and learning tool. Describe the types of classroom applications and in what content areas. *Our school garden performs an important function in the infusion of sustainability into the curriculum. The garden is utilized at every grade level, in various subject areas. 1st graders use the sunflower garden when they look at parts of a community. The 2nd grade recreates a Lenape garden to show the interdependence between the three sister crops (corn, beans and squash). 3rd graders, who run our compost program, observe decaying pumpkins from autumn until spring. In 4th grade, students use the garden when understanding irrigation and 5th graders compare it to the ancient agricultural societies about which they are learning. This past autumn, the 6th grade students designed their own experiments to see if different forms of communication will have an effect on kale's growth. While sitting in the garden, 7th graders discuss and observe photosynthesis in action in the spring and the 8th graders come full circle in their leadership revolving around our Harvest Soup celebration, when we share our fall crop with the community. As well, our school chef has a plot in our garden which vegetables and herbs are grown and infused into the student lunches. A menu board, which makes students aware of the main ingredients in their food, also informs them of where the items come from as we do our best to model using local foods. Additionally, our summer camp uses the garden for programs on nutrition and healthy food.*

2B4.2 Describe how your school offers alternative healthy choices for fundraising events that involve food. *The food provided at fundraising, lunch and/or other events is consistent with our food policy. The food policy insists that food offered by the school contain no artificial colors or preservatives, no hydrogenated oils, high fructose corn syrup, nuts, nut oils or MSG. Fresh produce that is local and/or seasonal is preferred. Whole grains, organic animal protein and other ingredients are used whenever possible and feasible. Caters are informed of these policies and asked to abide by this policy when providing catering for off site events. Internal events are catered by our lunch program chef and therefore abide by all food policies.*

2B4.3 Describe how your cafeteria provides healthy food and beverage choices.

The lunch program caterer and chef abide by The Willow School food policy. The policy is as follows: The Willow School is committed to health and wellness by ensuring that the food provided by the School Lunch Program is natural and nutritious. No artificial colors or preservatives are used in the preparation of our school lunch program. No hydrogenated oils, high fructose corn syrup, nuts, nut oils or MSG are used. Fresh produce that is local and/or seasonal is preferred. Whole grains, organic animal protein and other ingredients are used whenever possible and feasible. The Willow School is a nut free campus. Under no circumstances should nuts of any sort, or products containing nuts, be brought to campus. Additionally, we are committed to expanding the palates of our students by offering a "new" and usual ingredient each
Tuesday. Tasting Tuesday provides an opportunity for children to sample and discover new foods prepared in new ways. Educational materials are provided at each lunch table about the highlighted ingredient. Menus are developed monthly highlighting our Tasting Tuesday, vegetarian and dairy free options. Some alternative menu choices are provided for those who have dietary restrictions. Water, milk, juice spritzers and tea blends are the beverage choices we provide.

Physical Education, Outdoor Opportunities, and UV Safety

2B5. Describe how school-supervised physical education activities take advantage of outdoor spaces.

The playground on The Willow School campus is a large wooded area in which students build forts and create countless imaginative games. The primary benefits outdoor spaces provide to wellness classes is the opportunity to offer greater range of activities that involve all the senses and a wide range of movements that are not rehearsed. For example, a simple game of tag played in a wooded area provides the mind and body with a host of challenges the child must solve in an instant during play. Jump the log, go right, and duck the branches. These types of movements train the mind and body to seek solutions by engaging all of the senses. Open field activities, such as kite flying, create an awareness of what's around the child. Students have to manage the wind, other kites and trees, bringing them inward to manage their flying. Also, a key component to our school mission is a constant reconnection to our environment and plants, trees and bird recognition are continually revisited.

2B6. Describe a unique or innovative health and physical education practice that uses outdoor spaces as a learning lab. *A unique wellness activity the school is involved with is a beach grass planting project. The project is to help with the restoration of coastal areas in New Jersey. Each child has the opportunity to plant a stalk of grass and maintain it in the classroom for several weeks. They are taught the benefits these grasses bring to the coast how it effects the landscape and the wildlife. When it is time, the kids travel to the New Jersey shore to have the experience of planting the grasses in the habitat. The participation in the planting, maintaining, delivering and working in a natural settling encourages a richer understanding of the environment. As well, as students explore the idea of communities and civilizations, they use the large wooded area of the campus to build shelters. They also identify a variety of native edible wild plants that grow on our school grounds.*

2B7. To what extent do school homework policies influence students' ability to engage in unstructured outdoor play? *The homework policy of The Willow school supports time for students to have unstructured outdoor play. Our policy states that ten minutes of homework for each grade level is assigned each night; the time is cumulative for each grade. Therefore, first grade gets ten minutes and by sixth grade students receive approximately sixty minutes of work to be done at home. All homework is practice and review of previously taught concepts. In middle school a flex period is scheduled to allow students extra time to get homework started under supervision of teachers who serve as resources so there is less to take home. All students from kindergarten through eighth grade have two outdoor recess times each day providing a total of fifty minutes of unstructured playtime.*

2B8. What percentage of your current student body has participated in EPA's Sunwise Program or an equivalent program regarding UV protect and skin health? *0%*
There is no specific program that we follow, however, awareness of UV protection and skin health can be found in quite a few aspects of our communication with the school community and in the curriculum. In our Parent Handbook, we have written into the Health section: "Outdoor activities are frequent during all seasons and most weather conditions at The Willow School. Parents are asked to apply sunscreen to their children, or to

remind their children to apply sunscreen, each morning before school." *As well, when the weather starts getting warmer in the spring, reminders are sent out each week in our digital Friday Folder about the importance of applying sunscreen. In the 6th grade study of light, sunscreens with varying SPF numbers are applied to UV beads with the goal of understanding the strength of UV rays.*

2B9. Describe any other measures regarding the school's built and natural environment that your school takes to promote student and staff health and which you feel should be considered.
To begin, our campus-style site plan requires walking and fresh air and encourages interaction among the community for physical and mental well being. The ring road to reach the center of campus, wood chip paths through the woods, and parking at the edges of campus encourage walking & jogging. The school has a series of inviting, large spaces with a variety of floor surfaces that persuade people to stay on campus to exercise together in different ways (eg. Yoga and dance). We provide indirect pathways across campus that slow your pace and deepen your sense of place. The ramps and stairs support physical movement vertically (no elevators on campus); and a variety of types of outdoor spaces invite students and teachers to make use of the whole site to teach and study outdoors, which strengthens well being in the out of doors and encourages all to effortlessly interact with their natural environment.

Ultimately we have adopted the belief of "biophilia," first promoted by E. O. Wilson, that humans have a connectedness with nature that is rooted in our biology, and our immersion in healthy environments results in good health and well being. We value the resources of the outdoors, but also acknowledge Americans spend an average of 90% of their time indoors. Children are at the greatest health risk from pollutants, so we pursue LEED standards for Indoor air Quality. Improved ventilation increases attendance and productivity. We use low or no VOC paints and coatings, and keep humidity below 60% to prevent mold. Helping to promote a healthy environment, buildings have a lot of natural lighting and windows, with screens that were designed for student accessibility. Every classroom in the lower school is equipped with a door that leads directly to the outside.

2B10. Describe any partnerships your school has made with community groups or private businesses to support student health and/or safety. *Our food service provider, Nourish to Flourish, has developed a nut-free organic lunch program. We are collaborating with New Jersey Safe Schools to become a location for collecting and evaluating data regarding our indoor and outdoor air quality. Students have planted and harvested organic crops for the Bernards Inn, a local restaurant, to participate in the relationship between healthy eating and sustainable business practice. Atlantic Health Care Systems comes to the Willow School each year to train the staff in CPR and First Aid. Our school nurse is part of the Non-Public Services Somerset County Education Commission where she attends workshops and receives information regarding a multitude of topics relating to health and safety. Fifth graders work with Watershed Ambassadors and URWA staff to determine the health of the Middlebrook stream that runs through our property and correlate the health of our watershed and protection of our tributaries with the health of our environment and us.*

2B11. Describe any other measures regarding the school's built and natural environment that your school takes to protect student and staff health and which you feel should be considered:
The Willow School constructed its main lower schoolhouse using recycled and sustainable products such as recycled denim insulation, repurposed timber and cork flooring. The classrooms themselves feature floor to ceiling windows providing natural light and encouraging student connection to the natural world. During the school day each child enjoys 2 recesses outside in the woods where sticks and stones are used to create forts, marketplaces, currencies for imaginative play. The school uses non-toxic cleansers and paper products, limiting the students' exposure to environmental toxins. The design team ensured avoidance of building materials that off-gas, meaning we will not encounter sick building syndrome. Each class participates in the school garden where they put garden to table into action every season. In addition, the school lunch program includes daily vegetables and fruits served on reusable dinnerware. Our grouped offices promote greater sense of community, collaboration and belonging for mental well-being. We have large feature operable windows that offer views to the surrounding natural environment, and help us utilize daylighting and fresh air; this helps reduce stress and ensure natural air movement and exchanges while promoting a healthy environment. Building designers carefully

selected soothing paint colors and natural materials that evoke biophilic reactions. We made an intentional choice to reduce the amount of aural (absence of bells or loud speaker announcements, other than emergency announcements) and visual clutter/stimuli (more student-created, authentic art vs. pre-printed posters), which also reduces stress. Furthermore, natural noise barriers such as trees & berms partially insulate the site from external noise pollution.

PILLAR THREE: ENVIRONMENTAL AND SUSTAINABLE EDUCATION

Element 3A: Interdisciplinary learning about the key relationships between dynamic environmental, energy and human systems

3A1. Briefly describe how you quantitatively measure student environmental science literacy:

At Willow we recognize the value in assessment as both qualitative and quantitative. Additionally, we believe that assessment serves two basic purposes, first, to improve instruction and second to provide an accurate measure for individual students to assess their own progress. Therefore evaluations take the form of teacher narratives, performance activities, teacher made tests, written self-evaluations by the students, and normed national tests. We recognize that any assessment is only one piece of information upon which we rely to form a full picture of individual achievement. We measure student environmental science literacy based on unit tests, authentic projects, written essays and verbal presentations. At grades K-5, there are checklists on every student's report card that highlight environmental science concepts and are marked off when a student has shown a proficiency in understanding these ideas. Proficiency is assessed through a student's ability to explain concepts in their own words, create work that demonstrates an understanding of the concepts, and then by translating concrete ideas into more abstract and creative projects. At the Middle School level, the same techniques are utilized, in addition to students receiving percentage scores, often rubric-based, on their work. Students must maintain a 70% or higher to reflect an understanding of the concepts.

3A2. Describe your school's environmental or sustainability literacy graduation requirements: Describe your school's environmental or sustainability literacy graduation requirements: *We require that all students complete the science curriculum course content as described in the science scope and sequence. This content is designed to meet the standards for sustainability as developed by the Cloud Institute, as well as the National Science Education Standards and the New Jersey Core Curriculum Content Standards.*

3A3. Describe how environmental science and concepts in sustainability are integrated throughout the curriculum*:*
Kindergarten: The concepts of interdependence and of "other" are investigated throughout the year. The classroom community is fostered by using the sustainable definition of responsibility, namely, our actions have impact on others, hence the choices we make need to take others, including the Earth, into account. Interdependence is investigated during the school wide Harvest Soup Celebration. The kindergarten's job for the celebration is to harvest the vegetables of the garden. By interviewing and surveying other school members' jobs for the Harvest Soup, the kindergarteners come to realize that all members have to work together to create a community that works. This exercise models in very concrete terms the idea of systems thinking. Another activity involves a school wide contest – Guess the Weight of the Vegetables Harvested. The kindergarteners collect the guesses, plot the data onto a hundred board, compare numbers, and determine who is the winner. Students participate in Project Feeder Watch and children learn to tally birds they see at our birdfeeders. One integrated unit is on Trees. As the children are learning about the science of trees, they are reading fictional stories about trees. As the children investigate bark, they write fictional stories about
the life of a tree based on its markings. As the children study the inside of the tree such as the xylem and the phloem, they write fictional stories about the workings and what happens inside of a tree. The children also create movement exercises that explain interdependence of tree parts. At the end of the year, the children put on the play, The Rainbow People. This play reinforces the idea of sharing resources, such as shelter, food, and water while respecting differences of people. Another activity where math is applied to sustainability is the kindergarten bottle cap collection for the Aveda Company. The bottle caps are sorted by their attributes before being dumped into the master collection box.

***1st Grade**: In first grade, students ponder the question, "Can I exist alone?" and they explore the concept of communities. Children explore the logical consequences of being a part of a community, for example, the sacrifice of personal liberty for the common good. Through this examination, the students begin to recognize various virtues as essential to a communal way of life, such as the blending of self-reliance with personal responsibility for others and the environment. From the study of the classroom community, the children progress to the more complex school community. They examine the school's facilities, focusing on the question of how the facilities reflect the values of the school, which for the Willow School, includes preserving our natural resources by using recycled materials. Within the context of examining the school community, it is hoped that the children will gain a greater appreciation for the concept of "giving back" to the communities in which we live. Towards that end, some of the projects the children undertake include: cleaning up the schoolyard and planting bulbs, shrubs, and trees to enhance its beauty. One special project involved the creation of a scarecrow to watch over and protect the vegetables in the Willow School garden. From the study of the school community, the children progress to the study of the Peapack/Gladstone town community. Applying their knowledge of money and banking, foods, businesses for goods and service, law and citizenship, and town planning, the children did various collaborative projects to reflect their knowledge. All of this is truly an exercise in teaching children to visualize themselves as thoughtful citizens. First graders read short nonfiction stories about endangered animals, pets, habitats, community helpers and careers chosen by individuals. Questions arise about how to care for oneself, others and the environment. What do I want to study based on who I want to become? Why are these animals endangered? What can we so to help?*

***2nd Grade**: Using multiple sources, students investigate the life of the 26th President of the US, Theodore Roosevelt, with a special focus on how early experience influenced Roosevelt's later legislative initiatives including his work on National Parks and animal preserves. A study of the Willow School property's history includes examining a collection of artifacts that have been uncovered by students at play over the past eight years. The story of the school's latest reclaimed and reconstructed barn is studied. Strategies are developed for counting, tallying, adding strings of numbers, graphing and interpreting counts as part of the annual Willow Pond population study. During a measurement unit students keep daily temperature records, create point graphs and monitor the school's heating and cooling systems. The classroom "green light" monitoring leads students to discover how the school's systems respond to outside temperatures. Students create field journals and illustrate books on the Willow Water System that includes downspouts, holding tanks, ozone treatment, toilets, septic system, plant bed, sand bed and infiltration bed. They also write a scientific report, the Willow Pond population study, and publish the report on the Center for Innovation in Engineering and Science Education's web site with similar studies from all over North America. First Nation legends are read and questions are answered about what the stories reveal about attitudes towards environment.*

***3rd Grade**: Students study the native people of North America and how they used the land. Students seek to answer the essential question, "How does land use impact future generations?" Students graph the compost and trash waste generated at lunch throughout the course of the year. They read stories, poetry and novels that allow them to think about and discuss the connections between the past and present. They learn about patterns of behavioral and cultural activities that were either detrimental or successful to achieving sustainability. Students use this information to make connections among people throughout history. They read historical novels, folk tales, and a book about ways in which children around the world work to bring about change.*

***4th Grade:** In fourth grade, attention is focused on multiple perspectives as students learn about the life experiences and cultures of others. The virtues program is used as a lens through which to study characters. Using the UN poverty curriculum, students graph world statistics. In their study of indigenous cultures, they learn about the importance of cultural preservation and the ethnosphere, in order to develop a sense of place, both "theirs" and ours. In conjunction with cultures, the availability of clean water is examined along with brainstorming solutions to rectify impure water conditions. As well, students take a closer look at the relationship between land and water, focusing on the causes and effects of erosion while trying to determine human responsibility in this process. Research is done on various biomes in order to see the threats to and preservation of our natural world so the students can ultimately compare biological evolution to cultural evolution.*

***5th Grade**: Utilizing one of the upper branches of the Raritan River that flows through our campus, the students study Willowbrook and assess its quality based on chemical testing and presence of macroinvertebrates. They determine causes of poor test results and look for solutions. Students study*

various bodies of water and determine how they are connected to their watershed and write journal entries, poetry and Stream Stories. To study geometric measurement, students take photos of our campus and look for geometric shapes occurring in nature. Students then take angle measurements, perimeters, area and search for parallel and intersecting lines. In the exploration of ancient agricultural societies such as Mesopotamia, students engage in a simulation to learn the importance of natural resources and how, if not protected, they have brought on the demise of a civilization.

***6th Grade**: In Social Studies, students explore the power-relationships agricultural societies established, and understand how and why a hierarchical structure was maintained. Students also investigate how geography affects culture. They learn about the diverse environments China's geography contains and how they produce different needs and adaptations. To translate visual and written information into a sensory experience, they create a huge map of China using tables and objects to represent vegetation, housing, rivers, etc. and discuss how the various regions might be similar and different. In one particular Math unit, students design, calculate costs for, and build model homes that incorporate sustainable concepts into the construction. In Science, sixth graders explore the components of Experimental Design and ultimately create a class experiment that focuses on plants in one of the garden plots on campus. In English, students delve into the world of Dystopian societies. In their quest to discover how one person can make a difference, students read and analyze a variety of literary pieces in order to explore issues of equality and fairness.*

***7th Grade**: Focusing on challenges created by migration and invasion, children study the rise of Ancient Greece as a response to the Persian invasion, and of Rome. This study also provides case studies for the inquiry into the following questions: How do we solve conflicts? How do human responses to challenges change the human and natural environment? What happens when people fail to adapt to new challenges in their transformed environment? Are militaristic responses to challenges effective ways to handle problems? What happens to a society when it ceases to come up with creative solutions to fundamental problems within itself and instead tries to hold on to its previous achievements through force and violence? What causes civilizations to rise and fall? In Science, students spend the year recording the phenological changes taking place around The Willow School campus, with a focus on eight self-selected plants for the yearlong study. After recording the qualitative and quantitative changes taking place with these plants, the students ultimately create phenology journals and give campus tours to students, parents, faculty and staff.*

***8th Grade**: Students discuss how the "common good" depends a lot on how one defines "community." Is "community" our immediate neighborhood? Our town? Our state? Our country? All of humanity? Or perhaps should it also include all living things, the entire planet? The way we define community influences how we define "common good." These discussions play a role in understanding what the Founding Fathers wrestled with in defining the common good and the new nation they were creating. In addition, thinking of human activity as an event nested in the earth's systems is at the core of what we teach our students to be able to do at Willow. This student-initiated discussion usually results in food for thought rather than fast answers, and it nurtures the intellectual curiosity and engagement needed for future inquiry. This is tied in with taking a step back and understanding how Earth systems have been created and recreated over billions of years leading up to a place-based study of the Willow School campus. This study explores natural systems that have evolved here over time and demonstrate how human decisions and interactions have affected the landscape. In Language Arts, students write their own land ethic based upon their Willow education.*

3A4. What percentage of last year's graduates last year completed Advanced Placement Environmental Science? *Does not Apply*

What percentage of these students scored 3 or better on the Advanced Placement Environmental Science assessment? *Does not Apply*

3A5.1 To what extent are your students successful on the New Jersey Department of Education's science assessments? Does not apply.
NJASK4 *n/a*
NJASK8 *n/a*
New Jersey Biology Competency Test *n/a*

3A5.2 Describe any honors or awards that your students have received in the past two years as a result of their

academic or extracurricular activities with environmental issues or sustainability. *One of our students won first prize in the IDEO – Living Climate Change Video Challenge. In his film, "Two and a Half Billion Ideas," our student focused on the innovation and positive energy of children that offered solutions to combat Global Climate Change. He won $3000 plus a "Deep Dive" half-day workshop with IDEO. At the conclusion of our Middle School Trip to Fairview Lake in September 2011, the students were presented with The Green Award for "exhibiting caring, honesty, respect and responsibility for the Earth and for one another."*

3A6. Describe the professional development opportunities in environmental and sustainability education made available to all teachers in your school. What is the estimated percentage of teachers who have attended those opportunities? *Our school has worked with The Cloud Institute since 2006. Jamie Cloud was contracted for the school year 2007/08 to provide professional development on education for sustainability. 100% of the faculty participated in four full day workshop sessions during the year. Additional professional development took place at the Outdoor Education Center in High Bridge, NJ for the entire faculty and administrative staff in 2009/10. We have had 100% participation in a series of discussions regarding the topic of "the story of place at Willow" facilitated by Regensis, an environmental consulting group from New Mexico. Most recently, Tony Schwartz from Project Energy in NY gave a four-hour workshop to the full faculty.*

3A7. Describe how your school's environmental education program emphasizes student active engagement in scientific practices, such as asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, using mathematics and computational thinking, constructing explanations, and engaging in argument and applications based on evidence: *Please look back at the response to question 3A3 to get a deep understanding of how we do this. As well, taken right from our Curriculum Overview of The Willow School's Science and Environmental Studies program:"The Willow School science and environment curriculum brings children together with the natural and physical world in a program of exploration and discovery. Throughout the curriculum, children are taught and encouraged to act in a context of inquiry and research: to ask probing questions, to formulate and test hypotheses, to draw conclusions and to verify the accuracy of their conclusions. They are taught to experiment, to record results, and to analyze results for both expected and unexpected findings. The science program is integrated with other subjects, allowing students to explore such concepts as the impact of science on cultures, religions, and civilizations, the connections between scientific thinking though and the arts, and the many uses of mathematics in the scientific world. They also learn to apply scientific methods to research and thought in other subject areas. Through the study of the ecology, woven together with elements of chemistry, biology and physics, students learn about many aspects of the natural world, including plants and animals, earth and space, and land and water. Environmental studies are a vital part of the Willow School science program at all levels. The school's 34-acre site is integral to the curriculum, allowing for on-site studies of forests, wetlands, water quality and groundwater systems, seasonal changes, environmentally sensitive building design, renewable resources, sustainable grown, and regeneration."*

3A8. Describe the extent to which students are engaged in meaningful outdoor experiences (an investigative or experiential project that engages students in critical thinking, problem solving and decision-making.

Kindergarten: *As part of the Harvest Soup Celebration Interdependence Project, kindergarten students participate in planting and harvesting vegetables in the school garden. On Earth Day, students collect, identify and sort garbage (though not much) that is found on the Willow School campus. In participating with the Project Feeder Watch program, students have to count and classify birds. As well, in their study of trees, wetlands and frogs the students are outside often in our forest and at our pond.*

1st Grade: *First graders have an in-house field trip each year to learn about the beautiful school they attend. We read the book, Barn Saver and learn about the different recycled materials used to build The Willow School. First graders plant and harvest the crop each year in preparation of our Harvest Soup Day. They also create a scarecrow to protect the crops from the crows and other creatures. They also create a small garden in their community in the woods with the understanding that food is essential for a community to exist.*

2nd Grade: *Students do a population study of the on-site pond. A report is written and published and data is*

compared to previous year's data. Students plant a Lenape garden. The idea of interdependence is explored using the growth relationship of the three sisters crops. Students do an archaeological dig on the property. Students are encouraged to be anthropologists when they excavate, map, record and interpret. Students visit the Great Swamp Outdoor Education Center where they participate in a number of "Lenape workshops." The program includes a walk through the swamp with a focus on plants that were used by the Lenape.

3rd Grade: *Students plant and grow vegetables for Harvest Soup learning about times to plant and how to ensure growth from year to year._Students watch the life cycle of the pumpkin both at a farm on a field trip and in our on campus garden. They create scientific drawings and describe their observations. Students create a compost bin learning about the necessary components and their purpose in the bin. They also help maintain the school wide composting program.*

4th Grade: *Students plant foods in the garden of cultures being studied when possible. They study agricultural techniques: and try and recreate terracing and irrigation methods on campus. They also take a field trip to Sandy Hook in order to study and experience salt marsh ecology.*

5th Grade: *Students grow vegetables for their Island Project (food that would grow in the geographical location of their made up island). On Earth Day, students have mulched the Rain Garden and weeded invasive plants at Fairview Farm. As part of a service-learning project, students help raise funds and awareness for charity:water, which builds wells in villages without access to clean drinking water. Using our pond and campus, students at all grade levels recreate the water walk of women in African villages. As a field trip, students visit the Environmental Disposal Corp. to see how wastewater is treated and returned to our watershed. They continue the exploration of water ecosystems when they take a field trip to the Hackensack River. In addition, students also plant and harvest crops at Bernards Inn garden.*

6th Grade: *Students in the sixth grade spend a fair amount of time outside during their unit on Experimental Design. The class has to come up with an experiment that will incorporate a fall crop into their experimental question. In 2010, students looked at how different types of natural fertilizers effected the growth of chard plants and in 2011, they investigated how different forms of communication (positive speech, negative speech, music and no interaction) effected the growth of kale plants.*

7th Grade: *Phenology is explored throughout the entire year and involves continuous outdoor explorations. It is the study of the response of living organisms to seasonal and climatic changes. Keeping track of cyclical events from year to year and how they relate to the weather patterns is a large part of what phenology is all about. Like many naturalists, students keep a phenology journal to record events that occur through the seasons.*

8th Grade: *Students study the interdependencies between living organisms and their environment. One of the best ways to learn about ecology is to see it in action and the Willow School site is considered an "Ecotone" for this curriculum. Students use our site to compare and contrast human and geographical systems with other New Jersey physiographic regions.*

3A9. Describe innovative or creative approaches that your teachers have embraced to integrate learning about the key relationships between dynamic environmental, energy and human systems.

The school recognizes the inextricable link between human virtue and ecology. From the virtues program, which was designed to mentor the ethical relationships between humans, grew the commitment to cultivating that same type of ethical relationship between humans and the natural world. This leads to developing a sense of personal stewardship and love for the earth.

In the Kindergarten Wetlands Unit, the students reconstruct the wetland as a filter and compare it to the filtration functions of the human body. They also go on a journey of the water cycle as it relates to the cleaning of used water at Willow. In first grade, students do a unit of study in which they compare the respiration of plants to animal lungs. After an in-depth tour of our buildings and grounds, second grade students recreate and write about the interaction between humans and nature. The third graders spend the year learning about soil, food and decomposition in relation to the energy cycle while fourth graders compare the natural relationships between land and water and those created through systems of irrigation by humans. In fifth grade, students create civilizations that must adhere to all of the natural laws of geography and climate and in

sixth grade, students are designing solar-powered vehicles to race in the Jr. Solar Sprint competition that is organized by TransOptions, Inc. Seventh graders participate in a hands-on unit that helps students discover accurate information about the reasons for the seasons as they explore the natural and human effects upon global climate change and changing populations of invasive and endangered species. As part of their year in Earth Science, students investigate the engineering of buildings as they relate to natural disasters, and then try and build their own earthquake resistant structures.
One particular project worth highlighting was an interdisciplinary project done by 8th graders. It started with a Science trip to the Pine Barrens to examine the impact of human settlements on the environment. After reading through Aldo Leopold's writings, students wrote their own land ethic in English class. Meanwhile, in Social Studies, students were learning about citizenship and asking how we create a better future for all citizens? Students went to officials in the Township of Gladstone/Peapack and asked about some environmental problems. Ultimately, they determined the most pressing issue was that lawns create water pollution through fertilizers. In class, students then studied polluted bodies of water and evaluated the main causes so they could eliminate the problems. Students decided to create a program educating town citizens on creating an alternative method of landscaping with native plants that require no fertilizer. The students wrote up a proposed ordinance and presented it at the town council meeting. The Mayor permitted students to design and plant a model landscape garden in front of the Municipal Building. Some of the design aspects were incorporated into Math class. Ultimately, the students established their model garden, which contained signs explaining the effects of fertilizers and the benefits of using native plant landscaping. Several years later, the Township continues to incorporate ideas from this ordinance into their landscaping efforts.

Element 3B: Use of the environment and sustainability to develop STEM content knowledge and thinking skills to prepare graduates for the 21st century technology-driven economy

3B1. Describe how you quantify graduates conceptual understandings in physical, life and earth systems sciences.
At the Willow School, curriculum has been designed, developed and implemented using the NJCCCS benchmarks, the National Science Education Standards and the Cloud Institute's Education for Sustainability standards. At grades K-5, there are checklists on every student's report card that highlight these concepts and are marked off when a student has shown a proficiency in understanding these ideas. Proficiency is assessed through a student's ability to explain concepts in their own words, create work that demonstrates an understanding of the concepts, and then by translating concrete ideas into more abstract and creative projects. At the Middle School level, the same techniques are utilized, in addition to students receiving percentage scores, often rubric-based, on their work. Students must maintain a 70% or higher to reflect an understanding of the concepts. As far as curriculum goes, sixth grade focuses on physical sciences, seventh grade on life sciences and eighth grade on earth science. All three areas of science cross-pollinate throughout the grade levels.

What percentage of students take more than the minimum science requirement? *100%*

How many hours per week on average do students spend in science classes at the elementary- 4, and middle grades- *4 . (*Four hours a week is for scheduled science classes, but with an integrated curriculum, students receive more science than that each week.)*

3B2. Describe how your curriculum prepares and inspires students to pursue post-secondary options that focus explicitly on environmental and sustainability fields, studies, and/or careers? *N/A*

Community and Civic Engagement

Element 3C: Development of civic engagement knowledge and skills, and students' application of these to address sustainability and environmental issues in their community

3C1. Are all students required to conduct an age-appropriate, self-selected civic/community engagement project at every grade level? *No_X_* If not in all grades, please specify which grades: *Although students in every grade level participate in civic/community engagement projects that are selected as a class, only students*

in grades 6, 7, and 8 self-select these projects.

What percentage of these projects focused on environmental or sustainability topics?
50% Some examples of these projects include: Cutting away underbrush and pick up garbage at the River Road Park Pond in Bedminster, work at Schiff Nature Center to maintain trails, planning a date to pick up trash in the neighborhood and sending out fliers to neighbors providing information about the event, and cleaning Echo Lake Park in Westfield and hanging up signs which promote "Green" thinking.

What percentage of students satisfactorily completed such a project last year: *100%*

3C2. What percentage of last year's graduates scored proficient or better on a community or civic engagement skills assessment? *100*% (*The assessment was in the form of a comprehensive rubric-based trifold that was displayed on Earth Day for the Service-Learning Project showcase in which DEP Commissioner Bob Martin attended.)*

3C3. Does your school partner with local academic, businesses, government, nonprofits, informal science institutions and/or other schools to help advance your school, other schools (particularly schools with lesser capacity in these areas), and community toward the 3 Pillars? *Yes X_*
Briefly describe the scope and impact of these partnerships:

- *Alliance for New Jersey Environmental Education – we have provided tours for ANJEE leadership and members to gather curriculum and building ideas to share throughout the larger community. Willow School teachers have done workshops at the Annual ANJEE Conference and have gone on field trips to support ANJEE members*
- *Aveda – Kindergarten participate in the Recycle Caps for Aveda program*
- *Back to Nature – Landscape architects that have designed our campus and provided teachers with professional learning opportunities*
- *Bedminster Township – students conduct a clean-up with URWA staff at the river and pond behind the Bedminster municipal offices*
- *Bernards Inn – local restaurant in which 5th grade students plant and harvest organic vegetables from their garden*
- *The Center for Innovation in Engineering and Science Education – Students in grade 2 participate in the Bucket Buddies program*
- *charity: water – Students in grade five help educate students about the importance of clean drinking water through experiential fundraising to buy wells in African villages*
- *Cornell School of Ornithology – Students in grades K, 4 and 7 collect data for Project Feeder Watch*
- *Fellowship Village – Our Middle School students have created a partnership through annual concerts there. This connection has lead to our students providing this Continuing Care Retirement Community with new ideas about sustainable practices.*
- *Great Swamp – one of our teachers is a former staff member at the Great Swamp and leads field trips there; students in 3rd grade go there to do trail clean-up on Earth Day*
- *Hackensack Riverkeepers – Fifth grade students take a trip on the Hackensack each year and Captain Hugh has done guest lecturing at The Willow School*
- *Heifer International – As they learn about sustainable economies, students in Grade 4 create fundraising events to help purchase farm animals for families in developing countries*
- *Kopila Valley – A relationship with Maggie Doyne was established as she visited the school several times and our students ran a fundraiser to build a library for the Koplia Valley Home and School in Nepal*
- *Morristown Soup Kitchen – volunteers from the Middle School serve on the Community Soup Kitchen's youth council and fresh food from our garden has been donated to CSK*
- *Raptor Trust – As birds are studied in grades K, 4 and 7, students visited and have been visited by staff members (and birds) from Raptor Trust*
- *Raritan Headwaters Association (formerly URWA) – staff members give classroom instruction and assist students in assessing the quality of the Middlebrook and each year we participate in the annual Old Fashion County Fair*
- *Rutgers New Jersey Agricultural Experiment Station (NJAES) Cooperative Extension – A staff member at*

Willow has gone through the Master Gardener Program and we have incorporated curriculum ideas from the Farm to School program

- *Schiff Nature Center – Willow students have interned at Schiff and 7th graders have done garbage removal and trail clean-up on Earth Day*
- *TerraCycle – The Willow School community participates in several of TerraCycle's Brigades to collect previously non-recyclable or hard to recycle waste*
- *Willowwood Foundation – The Head of School is a Board member of the Willowwood Foundation Trust*

Since the completion of our first classroom building eight years ago, scores of educators, architects, engineers, environmental regulators, and business leaders from across the nation have visited the school to learn about the cutting-edge educational innovations and sustainable design strategies incorporated into our program. The feedback we typically receive from such visitors is that their experience at The Willow School has caused them to rethink the way they operate their own campuses and has encouraged them to take the first steps toward sustainability in their own schools or organizations. They have been especially impressed by the school's ability to create, through various "green" structures and mechanisms, an environment that embodies the interconnections between learning and the natural world, one that provides a fertile setting in which children can grow to understand these crucial connections, develop a sense of place, and experience the joy of learning.

3C4. Does your school provide outdoor learning opportunities for students (e.g. outdoor classrooms)? *Yes_X* If yes, describe how outdoor learning is used to teach an array of subjects in context, engage the broader community, and develop civic skills *As taken directly from our school's curriculum summary, "The school site is utilized as an outdoor classroom for the study of wetlands, forest and meadow habitats, observation of local plant and animal species, weather and seasonal changes, soil and geological studies, etc. Students will establish a garden to study plant growth and animal interactions, and bird feeders will attract local species." To reiterate just a few of the ways in which we do this: An experiential charity:water walk in which students have to fill jugs with water from our pond and walk around the campus to simulate what women in African villages experience when retrieving water; 8th grade interdisciplinary project on native plant landscaping; the use of our garden for academic and service learning projects such as Harvest Soup, Morristown Soup Kitchen, and a variety of interdisciplinary classroom projects; collecting and analyzing water related data from our campus pond and stream; 7th grade phenology class in which students identify over 60 species of plant life on campus and "adopt" eight of them throughout the year for observation and research; identification and removal of invasive plant species on campus; Earth Day activities in which students travel to various places outdoors for clean-up and renewal; Project Feeder Watch and bluebird box monitoring projects; Middle School student committee on designing and building outdoor classrooms.*

3C5. What other indicators or benchmarks (quantified whenever possible) of your progress towards the goal of 100% of your graduates being environmental and sustainability literate does your school feel should be considered by the review committee?

The most important aspects of the buildings and programs lie in their ability to facilitate the education of our students. Several studies have shown that students learn better in a healthy environment where they have significant natural daylight to read by and clean natural outdoor air to breath. But The Willow Schools buildings are not just safe, healthy and functional places where learning happens; they also are places that actively contribute to the formation of ecologically-literate citizens who understand the benefits of living in alignment with our planet's ecological systems. Every day and in a myriad of ways – from its use of less potable water to flush our waste and of fewer materials that contain toxins to its incorporation of recycled materials – the campus offers constant, active reminders to our students of the responsibilities they shoulder for being good stewards of our planet's natural resources and of the communities within which they live and learn. By exposing the building systems and materials to the building occupants and having the students participate in the operation of these systems, children begin to understand the consequences of their choices. It is our hope that the work being done at our school, even at this early stage of its history, is already generating significant benefits – not only for the students, parents, faculty and staff of The Willow School and our neighbors in the region, but for schools and communities throughout the United States.