U.S. DEPARTMENT OF EDUCATION

GreenRibbonSchools

U.S. Department of Education Green Ribbon Schools 2013

For Public Schools only: [ ] Charter [ ] Title I [ ] Magnet [ ] Choice

Name of Principal Mr. John Baird
(Specify: Ms., Miss, Mrs., Dr., Mr., etc.) (As it should appear in the official records)

Official School Name Westtown School
(As it should appear in the official records)

School Mailing Address 975 Westtown Rd.
(If address is P.O. Box, also include street address.)

West Chester PA 19382
City State Zip

County Chester State School Code Number* N/A

Telephone (610) 399-7911 Fax (610) 399-7601

Web site/URL www.westtown.edu E-mail John.Baird@westtown.edu

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate.

John W. Baird Date 2/12/13
(Principal's Signature)

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

District Name* N/A Tel.( )

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate. This is one of the highest performing green schools in my jurisdiction.

Date
(Superintendent's Signature)

**Private Schools: If the information requested is not applicable, write N/A in the space.*

U.S. DEPARTMENT OF EDUCATION

GreenRibbonSchools

PART II – SUMMARY OF ACHIEVEMENTS

Instructions to School Principal

Provide a concise and coherent "snapshot" that describes how your school is representative of your jurisdiction's highest achieving green school efforts in approximately 800 words. Summarize your strengths and accomplishments. Focus on what makes your school worthy of the title U.S. Department of Education Green Ribbon School.

PART III – DOCUMENTATION OF STATE EVALUATION OF NOMINEE

Instructions to Nominating Authority

The Nominating Authority must document schools' high achievement in each of the three ED-GRS Pillars and nine Elements. For each school nominated, please attach documentation in each Pillar and Element. This may be the Authority's application based on the Framework and sample application or a committee's written evaluation of a school in each Pillar and Element.

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 is one of those overseen by the Nominating Authority which is highest achieving in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.

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

Name of Nominating Agency **Pennsylvania Department of Education**

Name of Nominating Authority **Ronald J. Tomalis, Secretary of Education**

I have reviewed the information in this application and certify to the best of my knowledge that the school meets the provisions above.

Ronald J Tomalis Date 2/14/13

(Nominating Authority's Signature)

Pennsylvania Department of Education
Nomination for Green Ribbon Schools Award
Westtown School, Chester County

Westtown School is a Quaker pre-K-12 boarding and day school located on 600 acres in Chester County, serving students of all races, nationalities, and socio-economic backgrounds. Thirty-five percent of Westtown School students receive partial or full scholarships totaling $5.5 million each year.

The Westtown mission to "inspire and prepare our graduates to be stewards and leaders of a better world" permeates the culture of the school. From encouraging day students to bring no-waste lunches, to campus-wide food waste composting, conservation, and to education for sustainability in the curriculum, they teach students about their responsibility to, and relationship with, the environment.

In 2008, the school appointed a Sustainability Coordinator, the school's first endowed faculty position, and formed a Sustainability Committee. The collection of trustees, staff, outside advisers, and students works to create an environmentally literate and responsible community whose daily actions reflect care for the earth and its biodiversity. The school keeps an active webpage about sustainability efforts-and provides regular updates to students, parents, staff and the community.

Sustainability themes appear throughout the K-12 curriculum and Westtown offers advanced courses in Research Ecology and Environmental Science. Every student spends time at the one acre student organic farm and gardens as part of the curriculum. The student Environmental Club promotes conservation and education, and launched "Friends School Day of the Earth" conferences in 2007 and 2009. Students planned and led these two-day conferences, with 12 other schools participating in workshops and discussions about the environment and student leadership.

Campus-wide attention to conservation has cut electricity use 15 % since 2007. Coupled with the switch to natural gas from fuel oil in 2009, MT eCO2 emissions were down by 30.1% over 2007, and cumulative cost savings have surpassed $600,000. Although student enrollment has declined 10% since 2007, the number of residential students and staff has not changed, and the School has still achieved a 22.6% reduction in MT eCO2 per person from non-transportation building energy use. Westtown is moving aggressively to reduce GHG emissions even further, and are in the process of signing a two-year contract to purchase 100% solar and wind generated electricity beginning June, 2013. Their goal is to cut electricity use by another 35% by 2020 and achieve carbon neutrality by 2050 by taking one building off our gas-powered steam plant every 5 years.

The school's Energy Policy and Green Building Policy govern the construction and operation of all campus buildings. The newly renovated Facilities Building just earned LEED Commercial Interiors Certification, and the future science building renovation has been designed to LEED Gold standards. Balderston Dormitory has achieved national "Energy Star" ranking, and twenty-three faculty homes have been weatherized. Geo-thermal systems heat and cool two dormitories and five faculty homes, and a 44 kW solar voltaic array on the new Athletic Center generates 60,000 kWh/year.

Campus recycling and composting divert 51% of campus waste from landfills, up from 20% three years ago, and have cut hauling fees in half. In the "Green Schools Alliance Recycle Challenge" this October, Westtown earned 96% and was named a "Recycling Hero," placing 4th out of 67 schools nationwide.

The Westtown School dining hall serves food harvested by students, and 13% of food purchases for the school are locally sourced or organic. The school's 200-acre farm, in continuous operation since 1799, is leased for commercial vegetable production and two acres grow food for the Chester County Food Bank. A summer CSA on the student farm raised 7,800 pounds of food in 2011 for 15 families, the Chester County Food Bank, and the school dining hall.

Westtown co-founded the PAISBOA (Pennsylvania Association of Independent Schools Business Officers Association) Farm-to-School initiative that has inspired 20 member schools to source more of their food locally. The dining hall provides vegetarian and vegan offerings, and the resulting positive shift in student and staff food selections in recent years has been dramatic. Health classes emphasize good nutrition, and daily physical education is required of all students.

Plans to restore the 14-acre lake on campus are in process, and invasive plant species in campus woodlands are being systematically eradicated with student help. Native perennials, shrubs, and trees have been planted throughout campus, many by students, to improve habitat and protect bio-diversity.

Westtown has been recognized as a sustainability leader by the Green Schools Alliance (a national organization of 3,000 schools), Friends Environmental Educators Network (FEEN), Chester County Citizens for Climate Protection (4CP), and BLUER (West Chester Borough Leaders United for Emissions Reduction). Their work has inspired other schools to initiate gardening programs and conservation efforts. Westtown will host the FEEN (Friends Environmental Educator Network) conference in May, 2013.

The Westtown School has demonstrated significant results reducing energy usage while developing a plan to be a carbon neutral campus. The health and wellness of students and staff is a top priority, and students are fully engaged in the efforts underway to achieve excellence in all three pillar areas.

School Contact Information
School Name : Westtown School
Street Address : 975 Westtown Rd
City : West Chester
State : pa
Zipcode : 19382
School Website : www.westtown.edu
Principal First Name : John
Principal Last Name : Baird
Principal Email Address : john.baird@westtown.edu
Principal Phone Number : 610-399-7820
Lead Applicant First Name (if different from principal) : Meghan
Lead Applicant Last Name (if different from principal) : Sayer
Lead Applicant Email : meghan.sayer@westtown.edu
Lead Applicant Phone Number : 610-399-7911

Level
Elementary (PK-5 or 6)
Middle (6-8 or 9)
High (9 or 10-12)

School Type Private/Independent

How would you describe your school? Suburban

Does your school have at least 40 percent of your students from a disadvantaged background? (students who are eligible for free and reduced-price school meals, students with disabilities, who are limited English proficient, migrant, or receiving services under Title I of the Elementary and Secondary Education Act) No

Pillar 1: Environmental Impact and Energy Efficiency

Buildings, grounds and operations goal: The school has reduced its environmental impact and is working towards net-zero impact (zero carbon, solid waste, and hazardous waste footprints).

Pillar 1 includes four main elements:

A) **Reduced greenhouse gas emissions, using an energy audit or emissions inventory and reduction plan, cost-effective energy efficiency improvements and on-site renewable energy and/or purchase of green power.**
B) **Improved water quality, efficiency, and conservation.**
C) **Reduced solid waste production, through increased recycling, reduced consumption, and improved management, reduction, or elimination of hazardous waste stream.**

Expanded use of alternative transportation to, during and from school, through active promotion of locally-available options and implementation of enabling projects and policies.

Each question in this section is designed to measure your school's progress towards Pillar 1 and its associated four elements.

1A1: In what year was your school constructed? 1887 (the Main Building)

1A2: What is the total building area of your school? 459,152 square feet

1A3: Has your school constructed a new building or renovated an existing building in the past ten years? Yes

Please provide the following information:

Which certification did you receive and at what level? : LEED Commercial Interior

What is the total constructed area? : 2,500 square feet

Percentage of the building area that meets green build standards (for example: LEED, CHPS, Green Globes or other standards) : 76%

What is the total renovated area? : 8,700 square feet

1A4: Do any parts of your existing buildings meet green build standards (for example: LEED, CHPS, Green Globes, or other standards)? Yes

Please provide the following information:

What percentage of the existing building area has achieved green build standards (LEED, CHPS, Green Globes, or other standards)? : .05%

Which certificate did the school receive and at what level? : Energy Star Rated -- 78%

What is the total building area (in sq. ft.)? : 21,000 square feet

1A5: Please indicate which green building practices your school is using to ensure your building is energy efficient. Other (please describe): We are purchasing a Tridium system to better manage building energy consumption; a purchasing policy for energy and water efficient products is pending approval.
School Building has been assessed using the Federal Guiding Principles Checklist in Portfolio Manager.

1A6: Has your school received EPA ENERGY STAR certification or does it meet the requirements for ENERGY STAR certification? No

If your school received the certification, please note the year it was achieved and the score received.

1A7: Has your school reduced its total non-transportation energy use from an initial baseline? Yes

Please provide the following information:

Percentage reduction : 10.4%

Measurement unit used (kBTU/square foot, kBTU/student, annual therms, etc.) : 43,107.4 annual therms

Time period measured (mm/yyyy-mm/yyyy) : 01/2007-12/2011

How did you document this reduction (i.e. ENERGY STAR portfolio, district report)? : Independent Energy Consultant: Practical Energy Solutions, West Chester, PA

1A8: What percentage of your school's energy is obtained from:

On-site renewable energy generation (i.e. solar, wind, biomass) : Solar 2%

Purchased renewable energy : We are the process of signing a contract to purchase 100% solar and wind generated electricity by June 2013

1A9: Can your school demonstrate a reduction in its Greenhouse Gas emissions? Yes

Please provide the following information:

How did you document this reduction (e.g., the inventory module from Clean Air Cool Planet's Campus Carbon Calculator, EPA Portfolio Manager)? : For electricity and heating/cooling only: Clean Air Cool Planet

Campus Carbon Calculator v6.8, Independent Energy Consultant (Practical Energy Solutions)

Time period measured (mm/yyyy-mm/yyyy) : 01/2007 to 12/2011

Initial GHS emissions rate (MT eCO2/person) : 3.9 MT eCO2/person 2007

Final GHG emissions rate (MT eCO2/person) : 3.02 MT eCO2/person 2011

Percentage reduction : 22.6% (2011 vs. 2007)

1A10: Does your school reduce and/or offset the greenhouse gas emissions from building energy use? No

Please provide the following information:

1B1: What percentage of your students walk, bike, bus, or carpool (2+ students in the car) to/from school?
72-82%

1B2: How was this data collected and calculated? (Maximum 100 words)
Westtown has 642 students, of which 295 are boarders who live on campus and walk to school. Of the 347 day students, 170 use the Westtown van service or public school buses. This leaves 177 students. Therefore, 465 of our students participate in some form of green transportation as defined above. We estimate that 5-10% of the remaining 177 students participate in self organized carpools and/or are transporting 2+ students to school (siblings).

1B3: Which of the following policies or programs has your school implemented:
Our school has a well-publicized no idling policy that applies to all vehicles (including school buses).

Vehicle loading/unloading areas are at least 25 feet from building air intakes, doors, and windows.
Our school promotes bike/ped programs.

1B4: 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 use 20% biodiesel in our 5 school buses, and we own one hybrid sedan, 10 @ 10-passenger vans, and 5 mini-vans. Vehicles for school trips are sized for the number of students per trip. We carefully plan trips so that vans take efficient routes. Tire pressure and vehicle mileage are closely monitored.

1C1: Can you demonstrate a reduction in your school's total water consumption (measured in gallons/occupant) from an initial baseline? Yes

Please provide the following information:
Percentage reduction domestic : 19%

Time period measured (mm/yyyy-mm/yyyy) : 01/2008 to 12/2011

How did you document this reduction (i.e. ENERGY STAR Portfolio Manager, school district reports)? :
Internal spreadsheets with monthl tracking and reporting

1C2: Which of the following practices does your school employ to increase water efficiency and ensure water quality? (Please check all that apply)
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.

Our school's landscaping is water-efficient and/or regionally appropriate.

Our school has a program to control lead in drinking water (including voluntary testing and implementation of measures to reduce lead exposure).

Our school has implemented stormwater best management practices and/or low-impact development strategies (i.e. rain gardens, vegetated swales, pervious paving, rainwater harvesting, green roofs).

Our school uses water control features in bathrooms, locker rooms, kitchens, etc. that include, low flow faucets, automatic sensor faucets, low flow toilets and shower heads.

Please provide the following information about your school's landscaping

What percentage of your total landscaping is considered water-efficient or regionally appropriate? : 100%

What types of plants are used and where are they located? : native perennials, hardwoods, some ornamentals on top of campus

Please describe the alternate water sources used for irrigation or toilet flushing. (Maximum 100 words)

Please describe the program you have in place to control lead in drinking water. (Maximum 100 words)

We have filters on all drinking fountains. No lead solder has been used in the plumbing for decades. Annual tests show minimal to no lead contamination from our well water.

Please describe your best management practices for stormwater. (Maximum 200 words)

We have used pervious pavement in two recently renovated campus parking lots, and for all others we use retention basins and drainage systems. Our 600-acre campus allows for natural recharge of all of our storm run off. None goes into public sewer.

1C3: Our school's drinking water comes from: Well on school property

Please describe how the water source is protected from potential contaminants. (Maximum 100 words)

We have created a 254-foot buffer zone around the well head in all directions, based on Natural Land Trust recommendation to maintain the purity of the well water.

1C4: Please describe any additional progress your school has made towards improving water quality, efficiency, and conservation. (Maximum 200 words)

We have low flow faucets on every sink on campus and low flow shower heads on 80% of campus showers. We are undergoing a dredging of a 14-acre lake and dam rebuild on campus. The lake provides enormous benefit to the Chester Creek watershed as a nutrient sink. We have floating islands on the lake planted by students with native plants for nutrient uptake.

1C5: What percentage of the school grounds are devoted to ecologically or socially beneficial uses (school vegetable garden, wildlife or native plant habitats, outdoor classroom, environmental restoration projects, rain garden, pervious walking or running trails, etc.)?

92%, or 550 acres of our 600 acre campus. The remaining 50 acres are under blacktop for parking, and are taken up by buildings, walkways, or tennis courts. Our walkable campus includes 100 acres of meadowland, 200 acres of commercial farmland, a 10-acre arboretum, wetlands, 14-acre lake, walking and running trails through 200 forested acres, and 25 acres of playing fields.

1C6: Do any parts of your outdoor landscape meet the National Sustainable Sites Initiative guidelines? If Yes, please explain.

Yes: National Wildlife Federation award for our Lower School native plant and butterfly garden

1D1: What percentage of solid waste is diverted from landfilling or incinerating due to reuse, recycling and/or composting (i.e. Recycling Rate)?

B - Monthly recycling volume in cubic yards (recycling dumpster sizes(s) x number of collections per month x percentage full when emptied or collected). : 224 cubic yards/month

A - Monthly garbage service in cubic yards (garbage dumpster size(s) x number of collections per month x percentage full when emptied or collected). : 220 cubic yards/month

C - Monthly compostable materials volume(s) in cubic yards (food scrap/food soiled paper dumpster sizes(s) x number of collections per month x percentage full when emptied or collected). : 3 cubic yards/month

Recycling Rate = ((B+C) / (A+B+C) x 100) : 51%

1D2: Does your school have a composting system? Yes

1D3: Please provide the following information about your school's hazardous waste:
How much hazardous waste does your school produce (lbs/person[staff+students]/year)? : one pound per person per year

How is the amount generated calculated? : We took average total waste disposed of over the past three years and divided that by the current number of students, faculty, and staff.

List the types of hazardous waste generated : dead flurescent bulbs, batteries, occasional paints (though we mostly use now are low or no VOC), mercury thermostats (as they are replaced in our older buildings), asbestos (again, from older buildings).

How is hazardous waste monitored? : The Facilities Manager and Head of Grounds Crew track all hazardous materials.

1D4: Which of the following benchmarks has your school implemented to minimize and safely manage hazardous waste? (Please check all that apply)
Our school has a hazardous waste policy for storage, management, and disposal that is actively enforced.

Our school disposes of unwanted computer and electronic products through an approved recycling facility or program.

List the green cleaning standard(s) used. Green Seal Certified

1D5: Does your school use "third party certified" green cleaning products? Yes

Please provide the following information about the green cleaning products used in your school:
What percentage by volume of all cleaning products in use are "third party certified" green cleaning products? : 98%

What specific green cleaning product standard (Green Seal, Ecologo, etc.) does the school use? : Green Seal Standard

1D6: What other indicators do you have of your school's reduction of solid waste and elimination of hazardous waste? (Maximum 200 words)
Since 2010, we have increased our recycling from 20% of the waste stream to 51%. We finished 4th out of 67 schools nationwide in the Green Schools Alliance October, 2012 Recycle Challenge and were named "Recycle Heroes." Westtown's "score" of 96% was based on the number of properly sorted bins and a variety of solid waste reduction initiatives. Our waste hauling fees were over $60,000 several years ago, and we now pay only $30,000/year. We accomplished all this by increasing the number of paired waste and recycling receptacles outdoors and indoors throughout campus, and labeling them clearly. Simultaneously, we switched to single stream recycling, and have engaged in campus-wide education about what can be recycled. Our food waste composting system also reduces solid waste and provides soil amendment for campus gardens. We inaugurated a "return the cardboard box" policy with our office supplier; now when they drop off office supplies, they take away the empties for reuse. We recycle or refurbish for reuse all

unwanted computers and electronics, inkjet cartridges, batteries, clothing, and unwanted dorm furniture at the end of the year, and have changed over to non-VOC paints and finishes over the past three years throughout campus.

1D7: This is the end of Pillar 1. Please describe any other accomplishments or progress your school has made towards reducing/eliminating environmental impacts or improving your energy efficiency. (Maximum 200 words)

Five years ago the school appointed a sustainability coordinator and a sustainability committee to lead the school's sustainability efforts. Conservation, equipment upgrades, and behavior changes have reduced CO2 emissions from electricity and heating by 30.1%. In 2007, we hired an energy consultant to conduct energy audits on nine major campus buildings, resulting in upgraded lighting, installation of thermostats in every dorm room in the Main Building, and tighter building control. These improvements have increased comfort and improved the learning environment. In 2009, we switched from #6 fuel heating oil to natural gas, reducing emissions and costs significantly. Twenty-three faculty residences underwent energy audits; nineteen required minor improvements, and four received major upgrades including new wall insulation. One required a new boiler and the school elected to install geothermal heating/cooling. Five faculty residences and two dormitories on campus now have geothermal systems. Half of the 15.2% reduction in electricity use since 2007 can be attributed to capital improvements and better building control. The other half is due to education and behavior changes; the community has become more energy savvy: shutting down copiers, office lights, classroom lights and computers when not in use, on holidays and weekends.

Pillar 2: Healthy School Environments

Healthy student and staff environment goal: The school improves the health and performance of students and staff.

Pillar 2 includes two main Elements:

A) **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.**
B) **High standards of nutrition, fitness, and quantity of quality outdoor time for both students and staff.**

Each question in this section is designed to measure your school's progress toward Pillar 2.

2A1: Which of the following practices does your school employ with regards to pest management? (Please check all that apply)

Our school has an integrated pest management plan in place to reduce and/or eliminate pesticides.

Our school prohibits children from entering a treated area for at least 8 hours after the treatment or longer if required by the pesticide label.

2A2: Which of the following practices does your school employ to improve contaminant control and ventilation? (Please check all that apply)

Our school disposes of any unwanted mercury laboratory chemicals, thermometers and other devices in accordance with federal, state, and local environmental regulations.

Our school has CO alarms that meet the requirements of the National Fire Protection Association code 720.

Our school visually inspects all structures on a monthly basis to ensure they are free of mold, moisture, and water leakage.

Our school's indoor relative humidity is maintained below 60%.

Our school has moisture resistant materials/protective systems installed (i.e. flooring, tub/shower, backing, and piping).

Our school has a chemical management program that inludes: chemical purchasing policy (low or no-VOC products), storage and labeling, training and handling, hazard communication, spills (clean up and disposal), and selecting EPA's Design for the Environment approved cleaning products.

Our school prohibits smoking on campus and in public school buses.

If your school has combustion appliances, is there an inventory of them and are they annually inspected to ensure they are not releasing Carbon Monoxide? (yes/no/no combustion appliances): furnaces in faculty homes are tested annually

Our school has installed one or more energy recovery ventilation systems to bring in fresh air while recovering the heating or cooling from the conditioned air.

Our school has eliminated mercury-containing thermometers, chemical compounds, art chemicals, etc. and elemental mercury.

There are no wood structures on school grounds that contain chromate copper arsenate.

2B1: Which practices does your school employ to promote nutrition, physical activity and overall school health? (Please check all that apply)

Our school participates in a Farm to School program or other program to utilize local food in our cafeteria.

Our school partners with local food growers to supply produce.

Our school has an onsite food garden.

Our school garden supplies food for our cafeteria.

Our students spent an average of 120 minutes per week over the past year in school supervised physical education.

At least 50% of our students' annual physical education takes place outdoors.

Please list your school's USDA Healthier School Challenge award level or describe other nutrition program. (Maximum 100 words)

Please describe the type of outdoor exercise opportunities and nature-based recreation available to students. (Maximum 200 words)

Westtown sits on 600 acres of land comprised of farmland, wet land, meadow, forest and lake. There are two cross country trails as well as walking trails. Lower School provides outdoor play 2-3 times a day. On snowy days the lower school students are encouraged to bring snow clothes and sled during their breaks. The K-12 curriculum provides the opportunity to use the campus for study (i.e. bird walks, arboretum study, walking to the frog pond, visiting the farm). Middle school has outdoor recreation two times during the academic day as well as required participation in athletics after school for all students. In middle school, canoeing classes on our 14-acre lake prepare students for multi-day off-campus canoe trips each year. Our upper school requires each student to take a sport each term, and teachers use the campus often as an outdoor classroom. There is sledding on snowy days and work responsibilities that require students to participate in the agricultural program at the student farm. All three divisions participate in Outdoor Adventure Education revolving around our ropes course. Many peer schools visit our campus to use the ropes course, led by our trained and certified students and faculty.

2B2: Our school encourages teaching and learning outdoors on school property or has opportunities in neighboring public open spaces; such as parks, trails, or community gardens. If yes, please explain. Yes: Service projects and Earth Day planting projects often happen outside on campus or at the Coatesville Community Garden Project, in West Chester parks. Many classes use the campus for projects.

2B3: What percentage (by cost) of food purchased by your school is certified as "environmentally preferable" (e.g. Organic, FairTrade, Food Alliance, Rainforest Alliance, etc.)? 13%

2B4: This is the end of Pillar 2. Please describe any additional progress your school has made <u>in terms of the school's built and natural environment</u> (including unique community and/or business partnerships) to promote overall student and staff health and safety. (Maximum 200 words)
Our Trustees have passed policies to support environmental sustainability, including a No Idling Policy and Green Building Policy. Each new campus building or renovation project is required to use green building practices and result in LEED certification. Most recently we achieved LEED interior certification by renovating an old barn into office space, and our future science building renovation has been designed to LEED gold standards (slated to open in 2014-15). Other recent campus changes include installing high spigots on all campus water fountains for filling reusable water bottles, accompanied by a free reusable water bottles for all upper school students. This year we are transitioning from disposable white board markers in classrooms to non-toxic, refillable, recyclable Auspen markers. Food produced at our farm and student participation in the farm program from all divisions promote healthy eating. We established a Farm-to-School collaboration with local peer schools to purchase an increasing percentage of food from Philadelphia's "Common Market," a distributor of products from 100 local farms. We compost food waste in all three divisions using a variety of techniques (large bins at the farm, vermiculture in kindergarten, compost tumbler in lower school) and the use the compost to fertilize the school's gardens.

<u>Pillar 3: Environmental and Sustainability Education</u>

Student achievement goal: <u>Provide effective environmental and sustainability education, incorporating STEM, civic skills and green career pathways</u>.

Pillar 3 includes three main Elements:

A) **Interdisciplinary learning about the key relationships between dynamic environmental, energy and human systems.**
B) **Use of the environment and sustainability to develop STEM content knowledge and thinking skills to prepare graduates for the 21st century technology-driven economy.**
C) **Development of civic engagement knowledge and skills, and students' application of these to address sustainability and environmental issues in their community.**

Each question in this section is designed to measure your school's progress toward Pillar 3.

3A1: Is your school district's curriculum aligned to the Pennsylvania Environmental and Ecology standards?
Yes

3A2: Which practices does your school employ to help ensure the environmental and sustainability literacy of your graduates? (Please check all that apply)
Environmental and sustainability concepts are integrated throughout the curriculum.

Environmental and sustainability concepts are integrated into classroom based and schoolwide assessments.

Professional development opportunities in environmental and sustainability education are provided for all teachers.

Please describe your school's environmental or sustainability literacy graduation requirement. (Maximum 200 words)

Please describe your classroom based on schoolwide assessments in environmental and sustainability concepts and include what percentage of students scored "proficient" or better. (Maximum 200 words) Westtown conducts formative and summative assessments on a wide range of ecology, environment, and sustainability standards in all three divisions, in a variety of disciplines: science, history, art, religion, language, economics, and mathematics. The vast majority – 95-100% in any given year -- of our students demonstrate proficiency in these standards. From K through 12, students are taught, as is developmentally appropriate, inter-generational responsibility, systems thinking, ecological concepts, and the dynamic interaction of human and natural systems, and are then challenged to design models and engage in alternatives to current practices. Through an 8th and 12th grade individual service requirement, students demonstrate civic engagement, and often choose projects related to the environment and sustainability. Students at every grade level participate in service projects as a class, frequently at the farm, in neighboring communities and school gardens and parks, and across divisions. We are also able to measure students' grasp of environmental and sustainability concepts through overall compliance with campus recycling, composting, and energy conservation practices.

Please describe professional development opportunities available in environment and ecology standards. Include the percentage of teachers who participated in these opportunities over the past 2 years. (Maximum 200 words) 100% of Westtown teachers participate in a half-dozen in-service days, lectures, and faculty workshops each year for professional development; environment and ecology standards are included each year in those offerings. Programs that promote energy and resource conservation education, local food systems curricula, and healthy eating practices are also offered through our insurance wellness programs for all faculty and staff. Off campus conferences have included, for the past three years, a team of six teachers attending the Hathaway Brown conference in Ohio, which last year focused exclusively on sustainability and institutional change. Speakers invited to campus in the past two years have included Majora Carter (founder, Sustainable South Bronx) and Raj Patel (international sustainable food systems expert). In March 2013, the entire faculty will attend the NAIS conference in Philadelphia, which offers a plethora of sustainability workshops, including one by Westtown's Sustainability Coordinator on sustainable food systems in the curriculum. Westtown will host the FEEN (Friends Environmental Educators Network) conference in May, 2013, and all faculty will be invited to attend. Six Westtown faculty members will be presenting at the conference on ecological economics, sustainable food systems, ethics and business practices, and ecological social justice, among other topics.

3A3: If your school serves grades 9-12, please provide the following information:

3B1: Do your school's science courses frequently use sustainability and the environment as a context for learning science (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 from evidence when exploring environmental and sustainability issues)? Yes

Please describe. (Maximum 200 words)

Our science classes frequently use sustainability and the environment as context for teaching science.

- Advanced Research Ecology students design projects on campus, gather and analyze data, and propose changes in their concluding arguments. Example: measuring the impact of the high tunnel over time on soil chemistry, examining turtle and bird ecological relationships with the lake and farm habitats, monitoring water quality in Chester Creek, and studying invasive species proliferation.
- Environmental Science students define a campus problem, research other schools' approaches, then

propose alternatives for Westtown. Examples: sustainably processing campus gray water, improving water quality at the lake, and maximizing recovery of food scraps for composting.

• Advanced Physics students have explored the feasibility of wind generation on campus and designed uses for six donated solar panels.

• Chemistry students in teams are developing sustainable solutions to environmental problems as part of The Siemens "We Can Change the World Challenge."

• 6th graders compare the Chester and Christina watersheds and use Stroud Water Research Center simulation software to design water protection strategies.

• Lower school science classes observe, measure, and evaluate campus habitat health, species interaction, pollinators, nutrient flows, renewable energy, and sustainable food systems using raised vegetable beds.

3B2: Since green/sustainable concepts cross curriculum areas, where within the following standards content are they being taught, at what grade levels and what main resources are being used?

	What Standard Areas	Main Content Addressed	Grade Levels	Main Resources
1	PA Standard 4.1 Ecology	Systems thinking, living organisms, energy flow and food webs, habitat, population, bio-diversity, endangered species	K-5, 6-7, 9, 10, 11, 12, in all science classes, some coverage in history classes, economics, statistics, Research Ecology, Environmental Science	teachers' materials and textbooks, campus environment
2	PA Standard 4.2 Watersheds and Wetlands	Water cycle, water flow and quality, fresh and salt water ecosystems and health, topography, water policies	K-5, 6-8, 10, 11, 12 science classes, Research Ecology, Environmental Science, middle school canoe trips, Cape Henlopen 4th grade field trip	Stroud Water Research Center, teacher materials, Facing the Future textbooks, other science textbooks, our campus lake, wetlands and stream as topics of study
3	PA Standard 4.3 Natural Resources	Identification and conservation of resources, nature as teacher/model, preservation, exploitation, technology, conflict over resources	K-12 overall, Research Ecology, Environmental Science, but targeted in 2-5, 8th grade, 9-12th grades in history, art, science, language arts, languages	teachers' materials and textbooks, our campus environment, and data collected on energy consumption/production
4	PA Standard 4.4 Agriculture and Society	Soil composition, compost, decomposers, life cycle of plants, sustainable agriculture techniques, integrated pest management, farming and social/cultural development	K-12 in science, especially 7th grade, 11-12th Research Ecology and Environmental Science, Lower School Spanish, World History, US History, Health	teachers' materials and textbooks, our campus gardens (Lower School Raised beds and 1-acre organic student farm), Pete's Produce Farm
5	PA Standard 4.5	Human dependence on	K-5; 6-8; 9-12 in science,	teachers' materials and

	What Standard Areas	Main Content Addressed	Grade Levels	Main Resources
	Human and Environment	resources, waste management, consumer demands, technology, sustainable resource use, pest management, non-point pollution, climate change, recycling, social justice, global health, policy and regulation	history, economics, math	textbooks, the variety of habitats on campus
6	US Partnership Education for Sustainability Standard 1.1 Intergenerational Responsibility	Definition of sustainability, responsibility to future generations	K-12, all subject areas	teachers' materials and textbooks, campus environment
7	US Partnership Education for Sustainability 3.2 and 3.2 Personal and Collective Action	Personal responsibility, personal carbon footprint calculation, goal setting, making a difference, working together, community outreach	K-12, all subject areas	teachers' materials, textbooks, field trips, service projects in all divisions

3B3: Does your school have a STEM curriculum and/or coordinator? Yes

Please explain. (Maximum 200 words)

Our new STEM committee, led by Westtown's Director of Teaching and Learning, draws on the strengths of our existing preK-12 curriculum and new cross-divisional science teacher collaborations. Lower School students explore themes of the rainforest, space exploration, energy, machine construction, and Lego robotics. The 7th grade science curriculum has been restructured this year to include engineering, physics, robotics, aqua-culture, ecology, and design through hands-on projects. Our 8th grade science program is undergoing a similar overhaul for 2013-2014. The middle and upper schools both have active, highly competitive robotics teams that meet all year. The Upper School science program is Physics First. 95% of our graduates will take three years of high school science including Physics I, Chemistry I and Biology I. 85% of our students will graduate with 4 or even 5 science credits. After the initial three-course sequence students may take Physics II, Chemistry II, Biology II, Evolution, Environmental Science, or Research Ecology. We anticipate offering a course in Engineering and Design in 2013-14. 22% of our graduates go on to major in STEM (excluding psychology which sometimes is counted as a social science) fields in college.

3B4: Has the school's use of green building materials, alternative or renewable energy sources or green technologies, been incorporated into the curriculum and/or utilized by teachers and students in the classroom? Yes

Please explain. (Maximum 200 words)
Upper School Environmental Science has analyzed the solar array data and the school's monthly electricity bills to better understand the school's carbon footprint and envision ways to conserve, and has given input to the architects and engineers on green building materials for the new science building in the early design phase. Once the new science wing is complete, the Research Ecology students will be evaluating the effectiveness of the rain gardens that are being installed as part of an advanced storm water run off system. Calculus classes have also used the data from the 44kW solar array to create graphs and project how many panels, at what efficiency, would be needed to meet the school's entire electricity needs, given that the panels lose a fraction of their efficiency each year. Lower School science classes learn about the solar array and geothermal systems on campus during their unit on renewable energy.

3B5: If your school is a high school, does your school curriculum make connections between classroom and college and career readiness, in particular post-secondary options in environmental and sustainability fields? Yes

Please describe these college and career connections. (Maximum 200 words)
In research ecology students are introduced to a variety of research topics and how those topics relate to different fields of study that can be pursued in college. In anticipation of the expanded science building, we have put in place a number of collaborations with local college and universities (which aren't occurring yet but are ready to go) to give students more research possibilities and to encourage pursuing these science fields in college. Since 2008 67% of Westtown graduates have elected to attend colleges that are on the Princeton Review's Green College list. These "Green Colleges" are defined as "institutions of higher education in the United States and two in Canada that demonstrate a strong commitment to sustainability in their academic offerings, campus infrastructure, activities, and career preparation."

3C1: Do students conduct an age-appropriate, self-selected, civic/community engagement project at every grade level? Yes

3C2: Do students have meaningful outdoor learning experiences (experiences that engage students in critical thinking, problem solving and decision making) at every grade level? Yes

Please share how outdoor learning is used to teach an array of subjects in contexts, engage the broader community, and develop civic skills. (Maimum 200 words)
Learning happens outdoors frequently in all three divisions: Lower School science classes use the campus frog pond, lake, woodlands, NWF Certified Medicine Wheel and Butterfly garden. The Spanish curriculum includes gardening in the LS vegetable beds, and language arts classes use the gardens for writing inspiration. 7th grade science weekly and 5th grade once a term visit the greenhouse and farm to seed, tend, and harvest vegetables, build a large-scale compost pile, and learn about soil composition. A summer CSA at the farm brings 15 local families to the farm for 12 weeks, a perfect outreach opportunity in sustainable food production. Upper School students work at the farm as part of the work program, and can choose farming as their after-school sport, which includes visits to neighboring farms to learn about best practices. The school's ropes course is used by 1-12 grades, and is a weekly part of the 6th grade curriculum to teach physical challenge by choice, collaboration, and team building. Each year 6-8 upper school students earn ropes course certification. Alumni, parents, and neighbors are invited to use the campus for fishing and canoeing, social gatherings, nature walks, and volunteer opportunities to remove invasive plant species.

3C3: What opportunities exist for parents to learn about the green practices implemented at your school, including how these practices are benefiting the children and reducing operation and maintenance costs?
Student projects such as the "No Waste Lunch" and Earth Day tree planting videos of students are sent to parents in the weekly online newsletter with an explanation of how these activities integrate into the school's philosophy and program. Other online newsletters to parents also include "Green Tips of the Month." Parents report their students bring home green habits and ask their parents to conform. Some are simple like recycling or composting or packing a no waste lunch. Others are harder for parents to immediately fulfill like asking their parents to consider solar panels or a hybrid car purchase. Often at home the students become the teachers.

3C4: Please describe your partnerships with the local community (e.g., academic, business, government, nonprofit and informal science institutions) to help advance your school, other schools (especially schools with fewer resources) and the greater community toward the 3 Pillars. Include both the scope and impact of these partnerships. (Maximum 300 words)
Westtown co-founded in 2009 with St. Andrews School in Delaware and PAISBOA (PA Independent Schools Business Officers Association), the "Farm-to-School Initiative" which has been offered to all 150 member schools. Twenty schools now source food locally through The Common Market in Philadelphia, and receive educational materials for use in their school cafeterias as well as K-12 curricular ideas. Westtown and St. Andrews will be presenting a workshop on this program at the NAIS (National Association of Independent Schools) March, 2013 convention in Philadelphia, which will attract 5,000 teachers and administrators from schools across the country. Westtown donates food grown at the student farm each year to the Chester County Food Bank, and students glean the fields of Pete's Produce Farm (the 200-acre commercial farm on campus) for the Food Bank as well. The Willistown Conservation Trust CSA has been a resource for Westtown students as they learn about sustainable agriculture. Westtown has partnered with 4CP (Chester County Citizens for Climate Protection) and BLUER (Borough Leaders United for Emissions Reduction) to share information and resources, and Westtown's Sustainability Coordinator presented at the October, 2012 Climate Summit in West Chester, along with West Chester University and Downingtown School District on ways that schools can model climate protection practices. She has also given presentations on sustainable institutional practices at Kendal-Crosslands Retirement Community, Camden County Community College, West Chester Borough Hall, and West Chester University, and has given advice and tours of the Westtown farm program to dozens of schools that are launching gardening programs of their own.

3C5: This is the end of Pillar 3. Please describe other methods and measurements your school uses to ensure matriculating students are environmentally and sustainability literate. (Maximum 200 words)
Students in all divisions, through their daily activities, have opportunities to compost, reduce waste, recycle, grow their own food, and enjoy local harvests from area farms at school meals. Starting in the youngest grades, students use metal tumblers for their milk rather than disposable cartons, and so by the time our graduates attend college, these behaviors and cultural norms are second nature. On more than one occasion, graduates have exclaimed that their colleges are far behind Westtown in terms of reducing meat served at meals, composting, recycling, and basic energy conservation. Perhaps this story tells it best: at a recent regional band competition at another school, our upper school student musicians were dismayed to learn that the school had no recycling to handle the drink bottles served to the 200 or so students at the event. The Westonians gathered the empty bottles in trash bags and brought them back to Westtown on the bus to recycle. This seemed to them like a perfectly normal thing to do