2014-2015 School Nominee Presentation Form

ELIGIBILITY CERTIFICATIONS

School and District's Certifications

The signatures of the school principal and district superintendent (or equivalents) on the next page certify that each of the statements below concerning the school's eligibility and compliance with the following requirements is true and correct to the best of their knowledge. *In no case is a private school required to make any certification with regard to the public school district in which it is located.*

1. The school has some configuration that includes grades Pre-K-12.
2. The school has been evaluated and selected from among schools within the Nominating Authority's jurisdiction, based on high achievement in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental education.
3. Neither the nominated public school nor its public school district is refusing the U.S. Department of Education Office of Civil Rights (OCR) access to information necessary to investigate a civil rights complaint or to conduct a district wide compliance review.
4. OCR has not issued a violation letter of findings to the public school district concluding that the nominated public school or the public school district as a whole has violated one or more of the civil rights statutes. A violation letter of findings will not be considered outstanding if OCR has accepted a corrective action plan to remedy the violation.
5. The U.S. Department of Justice does not have a pending suit alleging that the public school or the public school district as a whole has violated one or more of the civil rights statutes or the Constitution's equal protection clause.
6. There are no findings of violations of the Individuals with Disabilities Education Act in a U.S. Department of Education monitoring report that apply to the public school or public school district in question; or if there are such findings, the state or public school district has corrected, or agreed to correct, the findings.
7. The school meets all applicable federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

U.S. Department of Education Green Ribbon Schools 2014-2015

☐ Charter ☐ Title I ☐ Magnet xx Private ☐ Independent

Name of Principal: Mrs. Janet Hartwell

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

Official School Name: Greens Farms Academy

Official School Name Mailing Address: 35 Beachside Ave. PO Pox 998, Greens Farms, CT, 06838

County: Fairfield State School Code Number *: n/a

Telephone: 203-256-0717 Fax:

Web site/URL: www.gfacademy.org E-mail: jtran@gfacademy.org

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

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

(Principal's Signature) Date: 11-12-14

Name of Superintendent: n/a
(Specify: Ms., Miss, Mrs., Dr., Mr., etc.) (As it should appear in official records)

District Name: n/a

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

n/a Date:
(Superintendent's Signature)

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 to the best of the Authority's knowledge.

1. The school has some configuration that includes grades Pre-K-12.
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: Connecticut State Department of Education

Name of Nominating Authority: Dr. Dianna R. Wentzell, Interim Commissioner
(Specify: Ms., Miss, Mrs., Dr., Mr., Other)

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

Dianna R. Wentzell Date: January 22, 2015
(Nominating Authority's Signature)

Greens Farms Academy
PK-12 Independent Day School
www.gfacademy.org

Summary of Achievements

In 1944, Aldo Leopold, a celebrated conservationist stated that "acts of conservation without the requisite desires and skill are futile. To create these desires and skills, and the community motive, is the task of education." Here at Greens Farms Academy, we believe that environmental conservation starts with the individual. When we use education to build environmentally literate individuals, we can change how populations interact with the planet. A major reoccurring theme at GFA is sense of place. We believe that if we can connect students to their surrounding world, they will value and appreciate it, thereby gaining a desire to protect and conserve nature. Our unique setting along Long Island Sound, which includes a rich and diverse salt marsh, Audubon trails, and Burying Hill Beach, allows us to take advantage of a sprawling "outdoor classroom" for hands-on, active learning.

As a PreK-12, independent day school, we have the ability to influence students from early childhood to adulthood and are dedicated to guiding students through a course of study encompassing academics, arts, and athletics. In a supportive community built on trust, we give our students the opportunity to become critical, independent, and creative thinkers and encourage them to explore particular passions that will sustain them throughout their lives. We believe that a diverse school environment enriches learning, creates respect for differences, and prepares students to become socially responsible leaders. By practicing good citizenship, demonstrating moral character and actively engaging in community service, our students embody the school motto, Quisque Pro Omnibus, Each for All.

Our academics are rigorous. Our curricula paired with innovative teaching lays a solid foundation for how to learn and to ask questions. As a student progresses through the divisions, teachers place increased emphasis on independent learning, research, critical thinking, and problem solving. Lower School provides a nurturing environment in which children grow intellectually, realize personal creativity and competency, develop self-confidence, build enthusiasm for excellence and achievement, and gain respect for the diversity of the world around them. Middle School provides solid grounding and direction to help students develop their own identity. Upper School students are frequently involved in an independent study, off-campus study, or a special project that connects them to schools, cultures, and current events around the world.

Many GFA classes are centered around the Harkness Table, where students engage each other in discussion, defending and exchanging ideas, skillfully guided by their teachers, who look for ways to connect students with their passions. We encourage students to question assumptions, to think critically, and to be intellectually curious. We offer numerous opportunities for study of the natural environment. Recent additions to the curriculum in the area of STEAM (Science, Technology, Arts, Engineering, and Mathematics), sustainability, robotics, World Perspectives Program, including International Relations and Economics, and the Global Online Academy give students an enormous range of classes and projects to explore. In our ever-changing world, it is perhaps now more than ever that human impacts on the environment must be changed to ensure a safe and prosperous world for future generations. We believe that our teaching and ecologically conscious institutional practices foster environmental literacy in our students. We feel that our students leave with an important sense of place and the ability to both reflect on how they interact with the environment and are prepared to seek careers in the environmental field if they so wish.

Our mission with respect to sustainability is to investigate and implement solutions that lead to

a more efficient and low-impact campus. Included in this is our effort to engage the entire community in events and education so that they understand how their decisions and actions can affect the environment. We hope that in doing so, our community can improve their impacts at school and beyond. We have worked hard over the years to establish many sustainability initiatives in the areas of waste reduction, water and energy conservation, green purchasing, and the preservation of neighboring ecosystems. Our grounds are perhaps one of the most ecologically sound in the area as we go beyond the requirements set out by laws like the Connecticut Pesticide Ban for K-8 schools. One example includes using only organic fertilizers and using lysimeter systems to capture and analyze runoff for nitrates that are responsible for eutrophication of natural waters. GFA believes that our school represents the standards required of a Green Ribbon School because we strive for sustainability in each part of our school system including academics, food sourcing and serving, water and energy use, waste, and materials and purchasing.

Documentation of School's Achievements in the 7-Steps

Step 1: Green and Healthy Outlook

Greens Farms Academy's Sustainability Council is co-chaired by Sustainability Coordinators, Jacqueline Tran and Tamar Cunha. The green team also consists of our Assistant Head of School, Director of Maintenance, Grounds Manager, CFO, faculty members across our three divisions, and the student leaders of the Upper School Eco Club. Together, we have worked to achieve many sustainability goals with ongoing initiatives that continue to promote our school's green mission and healthy outlook.

Composting and Recycling

We compost all kitchen scraps from the cafeteria, and daily, an Upper School compost crew takes the scraps to the compost bins located next to our organic garden. They maintain the piles, and the compost is used to replenish nutrients in our garden. The Lower School also has its own compost tumbler in the main courtyard for students to compost leftovers from snack or other greens and browns from their classroom. For recycling, we have surveyed the whole school to ensure that recycling bins exist next to every trashcan in the school, with the exception of bathrooms. The Upper School Eco Club organizes awareness events and announcements to educate the community about proper sorting of recyclables. We participate in the Green Cup Recycling Challenge every year to measure our success rate for proper sorting against other schools nearby.

Waste Reduction

Our Sustainability Council works to track resource use to gather data and continue developing strategies to reduce waste and conserve resources. Tracking includes solar data from solar panels located on the maintenance garage, "water bottles saved" from using refill stations at our drinking fountains, paper usage, kWh drawn from electronics, and total kWh used in the main building. We have collaborated with the Technology Department to move to a secure printing system to save paper. We have also worked to phase out personal appliances and printers in classrooms and offices to conserve power and resources. Last month, we received approval from our Headmaster to eliminate paper coffee cups and plastic lids. As of November 1st, faculty, staff, and students now bring their own mug to use, and visitors have mugs that are washed in our dish room.

School Wide Events

We hold school wide eco events throughout the year that ask for volunteer service or that raise awareness about a particular topic, with some reaching parents and the larger community. These events include International Coastal Cleanup Day (covering Burying Hill Beach, the salt marsh on

campus, and Sherwood Island State Park), Environmental Service Day to plant native flowers and grasses, Vegetarian Local Lunch Day, and bake sales that raise money for causes like solar kits for hospitals in Africa. Our Eco Club makes regular announcements to inform our community about our latest efforts. We recently started an Upper School Science Club where students are now learning about tree identification, measuring techniques, and forestry in preparation for the Connecticut Envirothon, a natural history and environmental science competition.

Figure 1 Environmental Service Day: April 26, 2014, The GFA community helped transplant 700 native plants for a native pollinator meadow in honor of Earth Day. We had over 50 volunteers attend.

Education

We use the many ecosystems around our campus as outdoor classrooms to enrich our students' learning, providing opportunities for our students to connect with nature and gain a better understanding of the world around them. We also have unique programs designed to build environmental literacy in our students (section 2). The North American Association for Environmental Excellence (NAAEE) standards are used in the Lower School science curriculum. They are currently being integrated into Middle School and Upper School science. In last year's self-assessment of the NAAEE guidelines for science across the three divisions, as well as Middle School and Upper School history and English courses, we found that the majority of skills and understandings are fully covered, with some partially covered. Only a few were not discussed at all. This is an area where we are currently working towards full integration as environmental education becomes more prominent at our school.

Partnerships

GFA maintains a close working relationship with the Connecticut Audubon Society. We have about 40 miles of Audubon woodland trails behind our school, which are maintained by a Middle School community service group that meets once a week throughout the year. They mark the trails, mitigate invasive porcelain berry and bittersweet vines, and clear paths for visitors. The group is also working to place more educational signs around the trails to inform visitors of invasive species, deer ticks, and poison ivy. Upper School sciences classes have conducted many surveys and experiments in the woodland trails to study populations of invasives, pH, and edge effects. GFA has also worked with U.S. Fish and Wildlife Service in assessing the portion of Long Island Sound closest to our school.

Many of the Coyle Scholars that have visited our school have done work related to sustainability. Twice a year, our Coyle Scholars program, started in 1996, brings to GFA inspiring, prominent individuals of scholarly and contemporary interest, public servants, academicians, people of letters, or other public figures who have made a sustained and lasting contribution to education defined in its broadest sense. Each visiting scholar is invited to spend the day at our school, attend classes, and work with our students. After a reception, the visiting scholar delivers a public lecture for the community-at-large. Most recently, we had the pleasure of hosting Dr. Ashley Stroupe, an engineer at NASA's Jet Propulsion Laboratory who programs and drives the Mars rovers past and present. Past

Coyle Scholars have also included Justin Hall-Tipping, science entrepreneur who focuses on nano-energy start-ups and environmentalist and documentarian Philippe Cousteau Jr.

Some schools have approached us for advice on how to start a garden program (our Seed to Table program is discussed in section 2). Our garden coordinator, Jacqueline Tran, has mentored a teacher from Georgetown Day School in Washington, D.C. She also communicates stories from our Seed to Table program through a blog: garden.gfacademy.org. We continue to develop a strong relationship with Rye Country Day where we communicate and share sustainability successes and initiatives both ways.

Step 2: Environmental and Sustainability Literacy

Developing environmental literacy is concentrated in our Lower School Seed to Table program and science courses PK-12. Courses outside of the sciences also cover environmental processes, human society, civic responsibility, food, health, population, impacts, and ecosystems. We aim to develop skills in the areas of questioning, critical thinking, analysis and interpretation, and decision-making and citizenship. All of these topics and skills are key to understanding society's role in the environment past, present, and future.

Lower School

Developing environmental literacy starts with our youngest students in the Lower School through our Seed to Table program, which is fully integrated into the curriculum. Seed to Table inspires students to develop meaningful connections with the world around them through explorations in our organic garden, experiences with food, and investigating the many natural communities that surround the school. GFA makes the most of its backyard, including a salt marsh, beach, and Audubon woodland trails. During the summer months, the program reaches preK-8th grade students from schools in Bridgeport, CT through Horizons National. Horizons students gain experiences that bring them closer to nature while learning strategies for better health and nutrition.

Figure 2Fifth graders harvest kale and squash in our organic garden after a lesson about systems and how the garden is a system.

We added pre-kindergarten this year and have developed a curriculum centered on the Seed to Table theme, which plays to our children's curiosity and excitement about the world. Students engage in sensory explorations and experiments related to growing, harvesting, and preserving food. The children's work in the garden allows them to understand the garden in many contexts:

Mathematical: How can we describe the shapes and patterns found in nature?
Scientific: What are the six plant parts and their functions?
Systematic: How is the garden organized?
Literary: How can we describe the garden using precise, honest words?
Artistic: Can we identify elements of design and materiality in the garden?
Musical: Does the garden produce sound?

Kinetic: Can we record paths or patterns of movement throughout the space?
Social: How can we express care for others as we explore and tend to the garden?

Lower School experiences with Seed to Table culminate in fifth grade as students explore the food system. Students take a closer look at where their food comes from and the environmental consequences associated with industrial agriculture and global trade. Fifth graders investigate each sector of the food system including production, processing, transportation, and packaging. In the production unit, students harvest, thresh, winnow, and mill wheat that they grow to compare their experiences with industrial wheat production. They make cheese to learn about food processing and compare minimally and highly processed foods. Fifth graders then take a field trip to Whole Foods to do a scavenger hunt, looking for fruits and vegetables and recording their country or state of origin. Students calculate food miles and associated carbon emissions from transportation. Their work here introduces concepts related to anthropogenic climate change. For the packaging unit, fifth graders work on a poster research presentation to learn about how aluminum, paper, plastic, and glass are sourced and manufactured. Their final project is to design a healthy, wheat-based snack with sustainable packaging for their kindergarten buddies.

Middle School

In the Middle School, one example of where environmental learning culminates is in a research project for the science fair. Many of the students' projects connect the ideas of engineering and design to green initiatives. Students might test the effects of green cleaning products on bacterial growth and resistance, the efficiency of aquaponics on plant growth, cost effective ways to boost solar panel output, studying deer populations in the Audubon trails, comparing the effectiveness of natural sunscreens to commercial products, or naturopathic approaches to wound healing. Students hone their critical thinking skills, creativity, and ability to work independently. Developing appropriate research and design skills help them to adapt to and prepare for the continually changing needs of our planet. Students present their work using a professional poster format at our annual Science Expo. Some students are provided the opportunity to share their work at the Connecticut State Science Fair as well. The overall goal of this program is to help students apply scientific concepts and engineered designs to global challenges.

Figure 3 Sixth graders investigate the efficacy and environmental impacts of eco-friendly vs. regular commercial dish soap.

Upper School

In the Upper School, students can choose to graduate with concentrations in STEAM (Science, Technology, Engineering, Arts, Mathematics) or World Perspectives. We are currently in the process of developing a program where Upper Schoolers can graduate with a concentration in Environmental Studies. STEAM fosters students' enthusiasm for using design to solve real world problems. The World Perspectives Program (WPP) encourages the cross-cultural connections, interdisciplinary knowledge, and modes of thinking essential for success in our interconnected world. To be the leaders of the future,

students need to understand global issues and demonstrate a commitment to making the future more sustainable. The curriculum focuses on three major global themes: health, climate, and population while stressing their intersection in the sciences and humanities.

Regular and AP Environmental Science teach many topics that factor into environmental literacy with plenty of critical thinking connections such as considering land impacts of meat vs. vegetarian diets and modeling questioning like, "How do we know what we know?" A final project involves designing green buildings and sustainable communities. Marine Biology examines the health of the Long Island Sound and students continually visit the local beach to make assessments like invasive shore crab population size. In history classes, students discuss access to food, water, and sanitation throughout time, and make arguments about historical events like the environmental ramifications of pesticides on species extinction. Foreign language courses examine culture, food, and environmental issues abroad. For example, Spanish investigates the effects of cash crops on land quality while Mandarin explores air pollution in China and what the government and citizens can do to combat the issue. English and Art classes find inspiration from the natural environment and often conduct classes outside when weather permits. Upper School programs abroad offer more opportunities for students to become globally minded, active members of society. Students take Human Ecology at the Island School in Cape Eluthra, Bahamas, study agriculture and biodiversity at the Chewonki School in Wiscassett, ME, and live "off the grid" at the High Mountain Institute in the Colorado Rockies.

Figure 4 Upper School students "write like Thoreau" at Burying Hill Beach for their Nature Writing class.

Step 3: Healthy School Environment

GFA complies with all CT school-based environmental health laws. We maintain a healthy school environment for our students both indoors and outdoors. Starting with grounds maintenance, our work favors an organic approach while working with the local ecosystem in mind. We don't just comply with the CT Pesticide Ban for K-8 schools- we take the organic approach to build healthier soils, maintain safe athletic fields and grounds for our community, and create strategies that have low impacts for neighboring habitats.

For years, we have been working to build healthier soils at GFA by using organic fertilizers like poultry manure, kelp, seaweed extracts, and fish emulsions. These natural additions ultimately create a more sustainable, healthy landscape. We value the land and want to add to its beauty and richness rather than adding chemicals that can leach out into the environment and disrupt ecosystem function. This is why we continue to plant native trees, shrubs, and flowers as much as possible. Last year, we added over a dozen native trees to the grounds as well as a field with native grasses and flowers to attract pollinators. Each Lower School class participated in planting a distinct native tree and learned about its role in the ecosystem.

In addition to healthy soil, our athletic fields require a more intensive cultural program to fend off unsightly weeds. We aerate our athletic fields three to four times per year to combat compaction.

We overseed our fields regularly to maintain turf density. We also spend many hours hand weeding our playing surfaces during the summer months to keep our fields safe and consistent for our athletes. Our grounds maintenance staff regularly tests the soil to monitor nutrient levels such as phosphorus. Even at very low levels, phosphorus can cause eutrophication of fresh water bodies. Naturally occurring soil phosphorus levels are typically sufficient for turf once it is established, so we do not apply phosphorus unless our soil tests show very low levels. If we do fertilize, we time it with seeding since it is only necessary for establishment during germination.

We continue to improve the environmental quality of our artificial turf field. A recent study showed that crumb rubber used to line the underside of turf leaches arsenic, benzene, nickel, and other heavy metals into groundwater (known carcinogens that are also hazardous to ecosystem health). Upon gaining this knowledge, we made it a priority to change our lining material and switched to a recycled plastic product. After switching however, we found that the small grains of plastic were easily swept up to the surface. In addition to getting stuck in our athletes' cleats, we noticed that the small grains of plastic could pose a threat to animals and could add debris to our nearby beach and marsh. At this moment we are about halfway through replacing the lining with cork. This is an extremely sustainable material because of its durability, biodegradable nature, and status as a renewable resource. Cork can be sourced from the bark of cork oak, leaving the tree to stand and regenerate. Our work with the artificial turf field goes to show how we put the health and safety of our students, community, and the environment first before laws require us to do so.

We use integrated pest management strategies to combat unwanted pests. One of the most problematic pests is white grubs. The grubs are the larvae of various beetles, the most ubiquitous being the Japanese beetle. These grubs feed on grass roots and, if left unchecked, can cause widespread damage. In addition to the grubs feeding on the roots, secondary damage can be caused by skunks and birds digging up the turf to feed on the grubs. One biological control option for white grubs, which is permitted under the regulations, is spraying parasitic nematodes. Nematodes are microscopic worms that specifically target white grub larvae. They enter the larvae and inject a bacteria that can kill the grub. We have been controlling white grub populations here on campus for a few years using parasitic nematodes with great results. The objective, as with all integrated pest management, is not to kill all of the white grubs, but rather to control the populations so that damage to the fields does not become visible. To communicate our work on the fields with the GFA community, we recently started a blog: fromthegfafields.wordpress.com. Our grounds manager also regularly teaches workshops on organic field and turf management to the local community.

Indoors, GFA regularly monitors and maintains equipment for indoor air quality. We contract with Grodsky to service our system quarterly. They also regularly inspect equipment to ensure that air filters are working properly and energy is used efficiently. We contract with Hygenix to test our air annually for temperature, humidity, volatile organics, carbon monoxide and dioxide, and other potential hazards to indoor air quality. To avoid contaminants that may affect indoor air quality, all of our cleaning products are Green Seal Certified, purchased from Sustainable Earth products. All surfaces are cleaned with the same brand using microfiber towels that catch dust and mops that are laundered daily. Our foaming hand wash is also fragrance free and Green Seal Certified. Floor finishes are low odor and are only stripped 1-2 times per year, usually during the summer. We also clean rugs, mats, and carpets daily to minimize dust that may trigger asthma. We use powerful, high quality vacuums that meet the Carpet and Rug Institute Seal of Approval/Green Label to remove soil and protect indoor air quality. We do not allow any cleaning products from outside sources that have not been approved for use at school.

Step 4: Healthy Nutrition

At GFA, we have implemented many progressive practices that enable a healthy and sustainable lifestyle. We contract with Flik Independent School Dining where nutrition and healthy food

sourcing are at the center of their philosophy. All of our meals and salad bar items are prepared from scratch daily using fresh whole fruits and vegetables. Ingredients are local and organic from ecologically conscious farms as much as availability permits. At GFA, we limit the amount of processed foods and offer whole grain, vegetarian and vegan options both in the salad bar and hot line. We only serve meat that is free of antibiotics, grade "choice" or higher, and seafood is purchased using Seafood Watch guidelines to ensure a sustainable choice. We also use cage free eggs and have milk that is certified free of rGBH/rBSt hormones. We offer 100% fruit juice and cold filtered water. We use healthy fats like olive oil and non-hydrogenated canola oil while avoiding preservatives, artificial flavorings like M.S.G., and high levels of sodium. We also have a selection of low-fat yogurt, cheeses and house made dressings and spreads available daily. We offer fresh deli meat and turkey roasted on site as well as freshly roasted vegetables at our sandwich station. We use china and stainless steel flatware to reduce paper and plastic consumption. Our parents and students are highly involved with making food decisions- a food committee meets quarterly to discuss how to improve our menu, sourcing, and overall sustainability.

In the Lower School, our daily family-style lunch brings kindergarten through third grade together for a communal meal. Here, assigned tables with students from mixed grades sit with a faculty member to share food, learn manners, and engage in conversation. This is a time when teachers and children of all ages get to know one another, try new foods, and play a role in all aspects of the meal including setting the table, serving food, clearing the table, and composting. The family-style lunch takes away the stress that can come with choosing friends at lunchtime, and everyone looks forward to talking with, and taking care of, students from other grades. Food from our garden that is not used for lessons goes directly to the kitchen. We also have a rooftop terrace next to the cafeteria where the chef can harvest fresh herbs daily. The cafeteria serves as a place where our Seed to Table program can come full circle. After planting seeds, learning about plant science, then harvesting and cooking a meal in class, students can try something new at lunch that includes the same fruits and vegetables they recently worked with. Our chef often visits Lower School assemblies and Middle and Upper School health classes to teach them about healthy eating and cooking.

In Lower School, students receive formal health and nutrition education through our Life Skills program (grades 2-5) and health courses (grades 3-9), which follow standards suggested by The State of Connecticut Education Department. Health classes teach students strategies and practices to promote positive health behaviors, which can also connect to healthy behaviors with regard to how they interact with the environment. In Life Skills, students learn the social, emotional, and cognitive aspects of childhood development. Lessons are designed to teach children critical inter/intrapersonal skills at their age appropriate level. The topics include celebrating individuality, increasing a "feelings vocabulary," friendship skills, assertiveness, conflict resolution, bullying prevention, the concepts of differing perspectives, and short and long-term consequences. Lower School Health uses hands-on activities, role playing, interactive discussions, and partner and small group activities, to teach the students how to communicate with others, deal constructively with feelings, resolve conflicts, and make positive decisions for their well-being. Some of the topics used to promote positive wellness choices include: nutrition, basic body systems and functions, fitness-diet connection, conflict resolution, interpersonal relationships, disease prevention, and personal hygiene.

In the Middle School, classes empower students to take control of their own health. Students learn skills for good decision-making, assessing risks, and non-verbal communication. Nutrition discusses the three main nutrients and how to best achieve a well-balanced diet. Students investigate human physiology to develop ways in which they can better cope with the stressors of modern life. In the Upper School, students learn about the human body and mental health. Students investigate topics like eating disorders, healthy eating habits, and stress. Classes discuss stress management as a preventative measure for more serious problems, siting healthy eating, exercise, and adequate sleep as important keys to keeping stress at bay.

Step 5: Physical Wellbeing

We support physical wellbeing through our athletics program, Lower School recess, and outdoor education opportunities. In kindergarten through third grade, students receive three 40-minute physical education classes each week. Fourth grade receives two 60-minute P.E. classes per week. In the Lower School, recess is considered an important opportunity for social development. It is during supervised, but unstructured, play afforded by recess that children learn the crucial social skills of negotiation, compromise, and arbitration. Children are watched at all times; they are given help with any problem when they request it, and interventions by a teacher always occur should conflicts be observed. Outdoor recess periods are held everyday, even on cold winter days. We provide sports equipment, sand toys, tricycles for pre-K, and sledding equipment during winter. We make sure that students are dressed appropriately for the weather. They have recess every morning for 20 minutes and for 30 minutes in the afternoon.

Fifth and sixth graders are required to participate in the athletic program all three seasons. They are given the opportunity to develop their skills and to learn about the rules and strategies in the majority of sports also offered in seventh and eighth grade into the Upper School. These sports include girls' field hockey, soccer, girls' volleyball, basketball, wrestling, fitness, lacrosse, baseball, and softball. Practices are required year round, three days a week. Each season, students gain experience in interscholastic competition with other independent schools in the area. In the fall, sub rosters are made for the girls' field hockey and soccer teams so that every girl gets a chance to try both sports.

The seventh and eighth grade athletic program is designed to develop strong bodies and minds and to maintain physical wellbeing at a level that is appropriate for the individual. Our goal is to help students become comfortable with and cognizant of their physical abilities and potential by providing opportunities for the development of sport-specific skills, coordination, self-confidence, and sportsmanship at a time of significant physical growth. A part of this process is challenging students through interscholastic competition. Students have the opportunity to both compete with other schools in a variety of sports as well as to engage in an appropriate and challenging recreational program. Each student is required to participate in the GFA athletic program all three seasons. In at least two of the seasons, the student must be on a team. Practices occur year-round, three days a week. Teams in each sport play a schedule of interscholastic games with area schools. In addition to the sports mentioned earlier, we also offer tennis, squash, and recreational activities like ice-skating.

In the Upper School, we offer a wide selection of competitive teams and non-team programs. The competitive teams emphasize success through the development of skills, conditioning, hard work, positive self-esteem, and cooperative effort. Each team plays a full schedule of interscholastic games. The teams practice four or five days a week. The non-team programs emphasize increased fitness and ability in a variety of "lifetime" sports by providing an opportunity to play and learn in non-competitive settings; these meet three days a week. In order to graduate from GFA, Upper Schoolers are required to fulfill two to three seasons of sports, depending on grade level, one to two of which must be on a team. An Athletic Independent Study can be granted to Middle and Upper School students who wish to participate in an athletic activity not currently offered at GFA. Past examples have included club crew, YMCA swim, organized horseback riding, or dance.

All coaches who lead P.E. and athletic programs are trained in proper stretching, warm up, and cool down techniques that they facilitate for each activity. Our athletic trainer is available to assess and treat all injuries on site. He is also present at all home games and we make sure that the teams we play away also have an athletic trainer on site. At each home game, we make sure to have ice, first aid kits, and water on site. Athletes are also reminded regularly to protect themselves with sunscreen and safety gear. Our school participates in The President's Challenge every year to test physical fitness and the fundamentals of healthy living. Students participate in five different challenge activities and their performance is measured according to ranges set by the test.

We regularly send information home to parents about topics like concussions, common injuries like with the ACL, and proper nutrition before and after games. Our coaches also talk to their athletes about what kinds of meals to eat before and after games. Coaches blog about game results after each event to share with the community on our website. We also send press releases to the local paper weekly to share our teams' results.

Physical fitness opportunities further exist through our annual 5K-race, the Fun Run, where all members of the community are invited to participate. We also have the Komera Global Run, a one-mile race open to the public that raises money for the Komera girls/scholars in Rwanda who also run on the same day in Rwanda to celebrate their right to education, leadership training, and social entrepreneurship. Upper Schoolers hold fun days where they invite Lower Schoolers to play games like capture the flag, kickball, and other recreational activities. These events also serve as babysitting opportunities to give parents some free time. We have an annual Senior-Faculty Basketball game where faculty and staff play against our whole population of seniors. Our athletics department is always staying up to date on current physical fitness standards and latest concerns.

Our director regularly attends conferences to receive professional development about health and wellness, counseling, eating habits, proper nutrition, and eating disorders. She recently attended conferences at the Harvard Medical School on health and wellness and one at Babson College about women's health to learn about concussions, hip and joint movement, self-esteem, and injury prevention.

Step 6: Energy Efficiency and Water Conservation

GFA takes many steps to examine energy efficiency and water conservation. On the large end of the spectrum, GFA is in the process of constructing a new Performing Arts Center that will be LEED certified. We have a 2.28 kW solar panel installation on our maintenance garage that covers two thirds of that building's energy needs. Because of our success there, we are now looking into installing additional solar panels onto the gymnasium. In the last five years, we have upgraded our HVAC and windows to highly efficient systems, which has greatly reduced our energy usage for heating and cooling. Our school is located within easy walking distance of a train station, which is used by students of all ages and faculty alike, reducing our community's energy usage and greenhouse gas emissions. Currently, 24% of students take the train while 20% of students ride a van or bus to school. Many of our students, faculty, and staff also carpool to school. We are about 60% of the way through converting all of our lighting to more energy efficient fluorescent bulbs or LED bulbs and have already cut our energy needs by 12,000 kWh in the first few months of the project. Lighting in about 70% of our building is on a system of sensors, with automatic shut-off after a few minutes of no motion. Appliances purchased for the school are all Energy Star rated.

While technology is an important tool in the teaching arsenal, we are conscious of the energy needs of such high demands on electricity. We have recently begun converting printers to a secure printing system that reduces paper waste, which also decreases our energy usage. Students are engaged in participating in competitions through the Greens Schools Alliance to examine energy usage and Upper School students often hold carpooling competitions to see which grade can have the greatest percentage of its students travel by carpool, bus, or van. Science classes in all three divisions discuss energy, and there are specific curricula to look at energy efficiency in classes such as Environmental Science. Eco Club students make posters and announcements about energy usage to better educate the student body. They have made small signs for classrooms to remind people to turn off and unplug technology when not in use. The members of the Sustainability Council often share strategies for reducing energy usage with the faculty at meetings and brainstorm ideas with members of the maintenance and IT staff.

When it comes to water conservation, we have many initiatives of varying scope. Two of our three parking areas are made of gravel to allow for water infiltration, and we have large green spaces making up the majority of our campus. Around those green spaces, an extensive drainage system is in place to capture, filter, reuse, and store runoff. Much of the runoff is used to water the grounds. Our septic system is carefully monitored for nitrate and phosphate discharges due to our location next to a protected salt marsh. For that reason, we use green cleaning supplies and are very strict about what enters the drains. For example in science classrooms, there are signs posted about what materials can and cannot be poured in the sinks. Additionally, our kitchen's dish room has a system that includes a grease trap to capture and recycle grease properly. Our water goes through a chiller that treats it using ozone, rather than a hazardous chemical, so that we are not contributing chlorine or other compounds to the groundwater.

Figure 5 Lower School and Middle School science classes collaborate in the salt marsh to measure water depth and velocity while learning about the local ecology.

All of our drinking fountains have water bottle fillers and count each time the sensor is used. Our Eco Club tracks that data along with our solar panel data to monitor our progress with conservation. There are no longer any 3-gallon flush toilets on campus, as all have been replaced with low-flow varieties. In our Middle School, several of the bathrooms have waterless urinals, and these will be included in the new building. Bathroom faucets are all low-flow, as well. Students in the Upper School encourage one another to reduce tray and dish use in the cafeteria and to consume less meat to reduce our water usage on both small and large scales. Students are introduced to the importance of water quality and conservation in their science classes starting in the Lower School. Because of the importance of the garden and our local ecosystems in our science curriculum, there are many lessons that focus on water issues. This continues on through Middle and Upper School science classes, especially in the Environmental Science courses. Many topics in history classes also incorporate the importance of water in human history, as well as human impacts on this resource.

Step 7: Green Purchasing and Waste Management

GFA considers waste management in many facets of its operations. On a student level, renewable and non-renewable resources are covered in science classes. For example, the Lower School holds a Renewable Energy Fair every spring where students share what they have learned about renewable resources, energy and design. They then build technologies like solar cookers, wind turbines, and solar cars and share their work with the greater GFA community. In the Environmental Science classes, students complete lifecycle analyses of simple products and compare the environmental impacts of various waste disposal options. Outside of the classroom, the Upper School students participate in work crews that help manage the recycling bin contents, pick up common areas on campus, and compost our kitchen scraps. The Upper School Eco Club has been active for over eight years and has spearheaded initiatives to get the cafeteria to switch from disposable plates and cutlery to the reusable ones we have now, to begin composting our kitchen scraps, and to phase out the use of plastic water bottles and paper coffee cups on campus. They also communicate to the student body about proper

recycling procedures and the rationale behind our waste-reduction initiatives via announcements and posters.

Figure 6 Fourth graders present wind turbines that they design and build for the Lower School Renewable Energy Fair.

One of our biggest sources of waste is paper, so the IT department shares information about printing double-sided (which is now set by default) and have recently started replacing all of our printers with secure ones that do not print out a job until a person types their code into the printer. This has reduced the amount of excess print jobs that were sent incorrectly, were forgotten about and reprinted later, or were sent to printers that had technical difficulties then printed when the problem was fixed. Members of the Sustainability Council remind faculty about other ways to reduce paper waste and to be more conscientious about recycling. One of our successes was convincing the GFA Parent's Association to stop organizing wrapping paper fundraisers because of the unnecessary waste associated with that. All of our paper towels at school are brown to reduce the impact of bleaching on the environment and our Eco Club educates the community about minimizing paper towel waste. The eighth grade science class is currently conducting a study on trees saved from using hand dryers. They are also looking at energy efficiency of various hand dryers like the Dyson Airblade. They plan to use their data to convince the Maintenance Department to install hand dryers in bathrooms.

We are currently working on ways to continue streamlining our purchasing of materials. Maintenance supplies (paper towels, paper, soaps, cleaners, etc.) are bought through one person in the business office who takes sustainability and cost into consideration when choosing supplies. We are starting to educate other staff members who have to buy materials for functions (such as paper plates, cups, cutlery etc.) to look at greener options and the Sustainability Council provides information about these options. When teachers wish to use different desks or chairs, our maintenance staff looks for ways to switch furniture from one classroom to another so that we purchase fewer new items and are reusing as much as possible. When updating items such as textbooks, microscopes, and computers, we look for ways to donate, repurpose or recycle as much as possible such as when we offered older computer monitors to members of the faculty and staff during a recent upgrade of materials on campus. At the end of the year, textbooks and uniforms are collected and resold within the community, and then donated. This reduces the number of new books and uniforms that must be purchased, and these programs are well received by the GFA community.

We carefully collect and separate many different types of materials for proper recycling or disposal, such as chemicals from the science classrooms, batteries, fluorescent light bulbs, and e-waste. This is in addition to careful sorting of recyclables by students, faculty, and staff on an individual basis. Our trash does go to a waste-to-energy plant (Wheelabrator Bridgeport), which converts the energy for electricity generation and is also looking at making their waste heat available via a district heating system. GFA no longer uses mercury in any of our science supplies and has recently disposed of its last mercury thermometers. We are in the process of clearing out older chemicals from our stock room that are hazardous and are no longer used. The science department has a safety officer who meets regularly with the maintenance staff to discuss issues like proper disposal of hazardous materials from cleaning and classroom use.

Future Directions

By the end of December, we plan to convert to single streamed recycling and improve education about emptying liquids to protect paper. We will also extend our composting program to include cafeteria waste in addition to kitchen scraps. This will require education about proper sorting, and part of this communication will be through clear, infographic style signs made by our Eco Club and art students. We further plan to streamline green purchasing to use compostable ware for events like faculty teas, parent visiting nights, and open house.

In terms of environmental literacy, we are looking to fully integrate NAAEE standards into science curriculum PK-12 by next year. As we design the optional diploma concentration program in Environmental Studies, we hope to critically investigate how this program can build a more environmentally literate student who will be able to succeed in an impactful career in the field. We would also like to collaborate cross-divisionally on how we assess student attitudes and understandings about the environment. Finally, we continue to look for ways on how we can use the construction site and building process of our LEED certified Performing Arts Center as a method to incorporate lessons on green design and other STEAM related topics.