



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.
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 Private Independent

Name of Principal: Ms. Talisha Thompson

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

Official School Name: Charles P. Murray Elementary School

(As it should appear on an award)

Official School Name Mailing Address: 24 Murray Road Building #7155 Fort Stewart Army Installation, Georgia, 31315

(If address is P.O. Box, also include street address.)

County: Liberty County State School Code Number *: N/A

Telephone: 912-369-1576 Fax: 912-767-3600

Website/URL: www.am.dodea.edu/stewart/murray

E-mail: talisha.thompson@am.dodea.edu

*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.

Talisha Thompson

Date: November 26, 2014

(Principal's Signature)

Name of Superintendent/Area Director: Dr. Samantha Ingram and Dr. Elizabeth Middlemiss

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



District Name: SC Fort Stewart DoDDS Cuba School District

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

Dana Wilmore Theresa Madeline Date: November 26, 2014, December 9, 2014
(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: Headquarters Department of Defense Education Activity

Name of Nominating Authority: Dr. Adrian B. Talley, Associate Director for Education, HQ DoDEA
(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.

Adrian B. Talley Date: January 29, 2015
(Nominating Authority's Signature)

SUMMARY AND DOCUMENTATION OF NOMINEE'S ACHIEVEMENTS

Provide a coherent "snapshot" that describes how your school is representative of your jurisdiction's highest achieving green school efforts. Summarize your strengths and accomplishments in all three Pillars and nine Elements. Then, include documentation and concrete examples for work in every Pillar and Element.

SUBMISSION

The nomination package, including the signed certifications and documentation of evaluation in the three Pillars should be converted to a PDF file and emailed to green.ribbon.schools@ed.gov according to the instructions in the Nominee Submission Procedure.

OMB Control Number: 1860-0509
Expiration Date: February 28, 2015

Public Burden Statement

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this information collection is 1860-0509. Public reporting burden for this collection of information is estimated to average 37 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The obligation to respond to this collection is required to obtain or retain benefit P.L. 107-110, Sec. 501, Innovative Programs and Parental Choice Provisions. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the U.S. Department of Education, 400 Maryland Ave., SW, Washington, DC 20202-4536 or email ICDocketMgr@ed.gov and reference the OMB Control Number 1860-0509. Note: Please do not return the completed ED-Green Ribbon Schools application to this address.



Charles P. Murray Elementary School

Headquarters Department of Defense Education Activity (HQ DoDEA) Nominee to
U.S. Department of Education Green Ribbon Schools Program



Prepared by
HQ DoDEA Facilities Branch
January 2014



Part I: School Application Information.

1. School Contact Information:

School Name: Charles P. Murray Elementary School
 Installation: United States Army Garrison Fort Stewart
 Street Address: 24 Murray Road Building #7155
 City: Fort Stewart State: GA Zip: 31315
 School Website: www.am.dodea.edu/stewart/murray
 Principal Name: Ms. Talisha Thompson
 Principal Email Address: talisha.thompson@am.dodea.edu
 Principal Phone Number: 912-369-1576
 Total school enrollment (Fall 2014): 370
 DoDEA District: SC Fort Stewart DoDDS Cuba School District DoDEA Area: DDESS
 School type: Elementary
 Percent Disadvantaged Background Population: >40%

2. Application Team Information.

Lead Applicant Name (who prepared the application): Dr. Lemuel Patterson
 Lead Applicant Title (e.g., teacher, principal): Mathematics Science Instructional Support Specialist
 Lead Applicant Email: lemuel.patterson@am.dodea.edu
 Lead Applicant Phone Number: 912-369-1427

Application Team Members: (Others who helped prepare this application)

	Name (First and Last)	Title/Department
1	Talisha Thompson	Principal
2	Rachel Strader	Sixth Grade Teacher
3	Curtis Shank	PE Teacher
4	Dr. Tom Morgan	Guidance Counselor



Part II: Summary of Achievements.

Summary Narrative:

Charles P. Murray Elementary School, in its new facility, which opened in fall of 2014, is a prime candidate for the Green Ribbon School award. Designed and constructed to meet Leadership in Energy and Environmental Design (LEED) Silver certification standards, its design is both environmentally friendly and energy efficient. All school stakeholders: architects, engineers, district support staff, teachers and students, are knowledgeable about the green resources found both inside and outside of the school building. The school’s state of the art design also helps to promote a healthy lifestyle for all installation stakeholders by maintaining a cleaner community around United States Army Garrison Fort Stewart.

During the design planning for the new school, building construction, and progress monitoring of the school site, environmentally-conscious team members developed an energy efficient school plant. The end-product, our LEED Silver certification school facility, meets green energy goals by providing alternative energy sources such as a wind turbine and over 450 solar panel collectors installed on the roof of the school. The building’s state of the art water return system minimizes the use of both water and energy through a carefully planned hot water return system that uses water heated by solar energy. Our ultra-low-flow flush toilets further minimize water use. Murray Elementary School’s food service facility also minimizes water use with efficient appliances, like controlled minimal water use dishwashers and utilizes recyclable water. The outside of the school features other sustainable features that help filter and control storm water run-off on the grounds, such as pervious parking surfaces and environmentally designed dry retention ponds.

Part III: Green School Program and Awards.

1. Does your school participate in a local, state, or national green schools program?

(x) Yes () No Program(s) and level(s) achieved:

List of Green School Programs:

	Program	Level in Progress	Level Achieved (include date achieved)
1	National Environmental	Emerging	Projected for April 20-24, 2015
2	Earth Day Network	Emerging	Projected for April 22, 2015
3	Recycling Team	Progressing Awareness	Full School Implement
4	GLOBE Program	Engaging	Currently Ongoing



2. In the past five years, has your school, staff, students or student groups received any awards for environmental stewardship, student and staff health and wellness, or environmental education/civic programs?
() Yes (x) No

Pillar 1: Reduce environmental impact and costs.

Element 1A: Energy conservation strategies.

1. Which of the following programs or practices has your school implemented to conserve energy and to protect our environment from the negative effects of buildings and transportation? (Check all that apply)

- Our school has an energy management plan in place that describes the steps we are taking, the key participants, our goals, and a schedule for conserving energy and reducing energy costs.
- Our school participated in an energy efficiency program that resulted in a comprehensive energy audit and cost effective energy efficiency improvements.
- Our school has set and met an energy conservation target every year since we started our program.
- Our school energy use is tracked and benchmarked using EPA ENERGY STAR Portfolio Manager or an equivalent installation program.
- Our school is EPA Energy Star certified this year.
- 5% or more of the energy used at our school is obtained from on-site or off-site renewable energy sources.
- Our new school (opened in Fall 2014) was built to meet Leadership in Energy and Environmental Design (LEED) green building standards.
- Our school has a greenhouse gas emission reduction plan in place that targets energy use. We measure our annual progress against our reduction goal.

2. Use the list above as a guide to describe how your school programs, policies, and actions have reduced the amount of energy used in your building(s). Include data. Also include information about your efforts to protect our environment from greenhouse gas emissions, how you set your goals for reduction, and how you measure your progress. Work as needed with your installation energy program management team to get information about your energy use (Maximum 250 words).

Through collaboration between designers, engineers, the Army Corps of Engineers, officials and school district representatives, a new Murray Elementary School was designed, constructed, and occupied in Fall of 2014. Included in the school's design are alternative energy sources such as photovoltaic panels, which maximize the reduction of greenhouse gas emissions. Energy audits are performed throughout the year to ensure cost effective practices are implemented within the 83,000 square foot facility. The concept of energy conservation is shared with students who brainstorm ideas for ways to save even more energy, such as making sure the lights are turned off when they go to lunch and suggesting that custodians cut lights off when they finish work in a classroom. Large windows in the building allow natural sunlight in,

so the need for artificial light is minimized (students use computers in class without overhead lighting).

Army Corps of Engineer Project Director, Susan Smith, and representatives from Architect/Engineer firm VOA Associates, state that the building meets the Leadership in Energy and Environmental Design Silver rating. Sustainability features include ten solar water heating panels which provide 40% of the building's hot water; the panels provide 24.9 megawatt hours per year, resulting in considerable energy conservation. The school is equipped with 456 solar photovoltaic panels, which provide 153.2 megawatt hours of energy per year, off-setting the school's energy consumption. A wind turbine on site serves as an education tool, providing a collection of data, and acting as a stimulus for career knowledge about energy engineering.

Element 1B: Water quality, efficiency, and conservation.

1. Which of the following practices contribute to the protection and conservation of the school domestic (drinking) water? (Check all that apply)

- We are served by an installation/privatized utility water provider that is required to report annually on the quality of our water.
- Our school has its own well and we do water sampling in accordance with our local and state health authorities.
- Our building maintenance department cleans all water taps and drinking fountains on a regular basis to prevent bacterial contamination.
- We have a water reduction plan in place that includes:
 - low-flow water fixtures
 - native drought-tolerant plants
 - minimal or no landscape irrigation
- Our school water use is tracked and benchmarked using EPA ENERGY STAR Portfolio Manager or an equivalent installation program.
- We use only non-potable water (such as water collected from a rain barrel or rain cistern) for irrigation.
- Our school has a greenhouse gas emission reduction plan in place that targets water use. We measure our annual progress against our reduction goal.

2. Use the list above as a guide to describe how your school implemented and is maintaining your water conservation program including your baseline, your goal, and your reduction rate to date. Explain how you will continue to reduce water use to meet your goal. Include who in the school participates in the water conservation program. Describe the work done to protect water taps and drinking fountains from bacterial contamination. Work as needed with your installation energy program management team to get information about your energy use (Maximum 250 words).



Our goal and reduction rate for water and energy conservation is met using several cost saving features and processes both inside and outside of the school to include solar water heating panels, efficient and low maintenance water pumps and boilers, and water efficient fixtures and appliances. Outside, native plantings that don't require an irrigation system are used to manage storm water. Students in the school utilize permanent drinking water containers. An implemented water sampling program ensures that potable water provided in the school is monitored and frequently tested.

Native "rain garden" landscaping outside Murray Elementary School improves the filtering of storm water, reducing runoff and providing biodiversity for students to study plant science. The bio retention basins control storm water runoff and offer an on-school site for examining the plants. The plants add beauty to the landscape and reduce the need for regular mowing. The University of Georgia has been contacted to form a partnership to identify and label the various native grasses and plants. Paved hard surfaces on site such as tricycle paths and parking lots have porous concrete that benefits the reduction of storm water runoff.

Water quality is important to all school stakeholders to facilitate a healthy lifestyle. To improve hygiene and avoid cross contamination with bacteria, faucet bubblers are not installed on the classroom sinks. The school district education operations team arranges regular water quality sample tests.

Element 1C: Waste Management and Product Procurement.

1. Which of the following programs has the school initiated and maintained to reduce solid waste, eliminate hazardous waste, and procure environmentally preferable products? (Check all that apply)

- Our school has initiated and maintained a solid waste management plan that includes waste reduction practices, collection of recyclable and compostable materials, elimination of hazardous waste, and preferred-purchasing requirements.
- Our recycling program collects every material that is collected on our installation.
- Our school composts organic materials on site.
- Our school only purchases office/classroom paper that is 50% or more post-consumer material.
- Our school only purchases office/classroom paper made of fibers from forests certified as responsibly managed in accordance with Forest Stewardship Council, Sustainable Forestry Initiative, or a comparable certification standard.
- Our school purchases office/classroom paper that is totally chlorine-free (TCF) or processed chlorine free (PCF).
- All new furniture purchases are certified by the Business and Institutional Furniture Manufacturers Association or a comparable standard.
- Hazardous and dangerous products at our school have been reduced or eliminated.
- Hazardous, dangerous, and universal wastes at our school are handled and disposed of in accordance with federal and state regulations.



Our school has a greenhouse gas emission reduction plan in place that targets solid waste reduction and recycling. We measure our annual progress against our reduction goal.

2. Use the list above as a guide to describe your solid waste management plan, including goals, materials you collect to be recycled or composted, your current recycling rate, and how you calculated the recycling rate. Include who participates in the waste management program, any student learning objectives, and the educational and environmental benefits to date. Provide an overview of your environmentally preferred purchasing. Work as needed with your installation hazardous waste program manager or recycling program manager to gather information about your efforts in this area (Maximum 250 words).

During the process of receiving new resources for the new Charles P. Murray Elementary School, a school solid waste recyclable system was implemented. Over a ton of cardboard from new equipment, original supplies, and receivable resources were stacked into huge recycling bins. A continuous recycling project developed with the installation's Directorate of Public Works now provides paper removal weekly. Student teams are assigned the task of collecting refuse and placing it for collection. Ink cartridges are stored and returned to vendors. We plan to begin composting in school year 2015-2016.

Murray Elementary is one of four schools on post at Fort Stewart. Our recycling collection is measured and then annual reports are presented recognizing the school that recycles the most in tons. Although our school is not the largest population on post, we are striving to win this recognition. Students have bought into the project and are committed and excited. They are encouraged to bring reusable water bottles for drinking which eliminates plastics. Paper use is offset by the use of technology savvy devices such as smart boards. Students were given recycle notices prior to the winter break so they were made aware of where to have their parents take their holiday Christmas trees to be ground up rather than throwing them out for trash pick-up. We believe strongly that the recycling practices taught at the school will carry over to the home.

Element 1D: Alternative transportation.

1. Our school provides the following alternative transportation options to driving in single occupancy vehicles to and from school. (Check all that apply)

Our school participates in a "Safe Routes to School" or similar program.

Our school has designated carpool parking stalls.

Our school offers yellow school bus service.

Our school is served by public transportation service.

All school buses that serve our students were built after 1994 when the first emission standards were adopted.

Our school has a well-publicized no idling policy that applies to all vehicles including school buses.



Our school has a vehicle loading/unloading area(s) at least 25 feet from building air intakes, doors, and windows.

Our school has a greenhouse gas emission reduction plan in place that targets transportation. We measure our annual progress against our reduction goal.

2. Use the list above as a guide to describe alternative transportation options to driving in a single occupancy vehicle to and from school. Include how the alternatives are promoted, any data you have about participation in school bus service, public transportation, carpools, ride-sharing, and commuting to school by walking or biking. (Maximum 250 words)

There are several features to promote alternative transportation efficacy while conserving fuel energy. Although the curb zones are marked for car-pools to load and un-load passengers, most students attending Charles P. Murray Elementary are pedestrians. The neighborhood zoned school has 97% of its students walking, biking or arriving with parent transportation. A bus provides transportation for the remaining 3% of special needs (SPED) students. Privately owned vehicles driven by staff and visitors are parked at least 50 feet away from the building. The vehicle area canopy along the walkway has a dual purpose: first, it provides shelter for persons entering the building during inclement weather and shade for waiting parents at the school's dismissal hour. Secondly, the canopy is designed to affix more solar panels to meet energy demands and energy conservation requirements during the 50 year life of the building. Closer to the school's entry are reserved parking slots bearing signs for energy efficient and alternative fuel vehicles.

Pillar 2: Improve the health and wellness of students and staff.

Element 2A: An integrated school environmental health program.

1. Which of the following programs or practices does your school implement to ensure the environmental health of the school community? (Check all that apply)

Our school implements an up-to-date Integrated Pest Management program.

Our school implements an up-to-date Indoor Air Quality Management Plan modeled after the EPA's Indoor Air Quality (IAQ) Tools for Schools or other national recognized model.

Our school has identified and properly removed sources of elemental mercury and prohibits its purchase and use in the school.

Our school does not have any wood playground equipment or other structures that contain chromate copper arsenate or we have identified these structures and have taken steps to reduce exposure.

Our school has a comprehensive green cleaning program.

Our school has tested all frequently occupied rooms at or below ground level for radon gas and has fixed and retested all rooms with levels that tested at or above 4 pCi/L or our school was built with radon resistant construction features and tested to confirm levels below 4 pCi/L.



Our school has an Asthma Management Program consistent with the National Asthma Education and Prevention Program.

Our school has a chemical management program in place, with elements of purchasing, inventory, storage, training, spills, and hazards communication.

2. Use the list above as a guide to describe how your school implements and measures the success of your integrated environmental health programs and practices to ensure the health and safety of the school community. Include information on how your school addresses exposure to health hazards including radon, chromate copper arsenate, carbon monoxide, chemicals, asthma triggers, and mold. (Maximum 250 words)

Establishing and maintaining a health and wellness program helps to ensure high productivity at Charles P. Murray. Our high standards for student excellence focus not just on academic excellence but also physical, emotional, and nutritional values for a healthy life-style.

A quality outdoor environment is integral for our school. As an alternative to pesticides, all natural applications such as diluted vinegar and soapy water are first applied to eliminate pests outside the school. If inorganic sprays are used, they are used sparingly. Cleaning products used in the school have a green seal rating, and chemicals are stored and monitored consistent with our hygiene officer's requirements.

School air quality promotes optimal energy performance in students through enhanced refrigerant management and thermal comfort controllability. The building has two air-cooled chillers which use R-134a with a 10.4 efficiency rating. The new design is oil-less, frictionless and quieter than most conventional chillers, enhancing the learning environment in the school. The outside air system for the gym and cafeteria has a single exhaust air energy recovery unit. Other units in the building include filters and ultra-violet Band C disinfection. Five dedicated outside air units filter outside air. The school has had initial testing for carbon dioxide, radon and mold. Tests for mold have been conducted since the school's opening; the school passed all tests. Incoming natural lighting and LED lights decrease the full reliance on florescent lights which contain mercury. There are no mercury thermometers in the elementary school's Science Technology Engineering Math (STEM) laboratory.

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

1. Which of the following programs or practices does your school implement to promote nutrition, physical activity, and overall school community health? (Check all that apply).

Our school participates in the "Coordinated School Health" program (www.cdc.gov/HealthyYouth/cshp/).

Our school participates in the USDA's Healthier School Challenge.

Our school participates in a Farm to School or comparable program to use local, fresh food in our cafeteria.



- Our school has a food garden either on-site or in close proximity to our building, which is utilized by the cafeteria or by teachers.
- Over the past year, our students spent an average of at least 120 minutes per week (for middle and high schools) or 90 minutes per week (for elementary schools) in school supervised physical education.
- At least 50% of our students' annual physical education and physical activity (including recess) takes place outdoors.
- At least 50% of our students have participated in the EPA's Sunwise or equivalent program (to protect students from skin cancer).
- Our school integrates health measures into student assessments.

2. Use the list above as a guide to describe how your school implements high standards of nutrition, fitness, and quality outdoor time for both students and staff. (Maximum 250 words)

While the school does not participate in the Healthy School Challenge, the district food service department has been recognized as exceeding state food service nutritional requirements. The district's food service department has received an award for its exemplary standard in serving healthy foods. Providing healthy servings of breakfast and lunch for students ensures that students get many of their daily nutritional requirements. The school's food service program does not serve fried foods; no deep fry equipment is installed in the kitchen. Whole wheat breads are baked, whole grain products are the selection of choice and fresh fruits and vegetables are provided. Field trips require bag lunches as opposed to off-site fast food patronage. Ice cream and birthday cake celebrations held in classrooms are discouraged.

The school grounds have designated areas outside for play. Structured play fields are marked for physical education classes; all students participate in physical fitness. Recess is provided daily for students to have free play. Playground equipment on site includes playhouses and tricycle paths for preschoolers while upper elementary students have swing sets, a ball court, and play fields. Competitive sports games between staff and students promote good health and teach good sportsmanship. During inclement weather, the gymnasium is available for recreational use. The staff is welcomed to use the gym for fitness and exercise after school. Collaboration between the physical education coaches at another Army post, Fort Jackson, and our school resulted in a competitive teacher fitness award program for staff members at three schools.

Pillar 3: Provide effective environmental and sustainability which incorporates STEM, civic skills, and green career pathways.

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

1. Describe how your school integrates and assesses/measures students' environmental or sustainability literacy at each grade level including curriculum, courses, outdoor learning, and assessments. (Maximum 250 words)

Students in grades four through six will transition from the school with at least three years of study focusing on environmental education. Our district wide Science Technology Engineering Math (STEM) initiative has focused on educating students on green technology. Over three years, at least one hundred presenters have promoted student awareness about the environment. The curriculum includes presentations from STEM resource persons representing the Forestry Division, the National Oceanic and Atmospheric Association, and the University of Georgia's Marine Education Extension Services. Students provide feedback about these events to the Domestic Dependents Elementary and Secondary Schools (DDESS) Area Service Center; the intent is to determine the impact of such "STEMposium" events on a student's future interest in STEM career pathways. Students have recycling activities throughout the year, including onsite visits from the Directorate of Public Works Environmental Division. Such events are arranged by the Principal and other environmental representatives.

2. Describe professional development opportunities available to your teachers in environmental and sustainability concepts and the number and percentage of teachers who participated in these opportunities during the past 12 months. (Maximum 250 words)

Teachers who transferred from existing schools on post to the new school have been invited to participate in several professional development sessions focusing on oyster restoration, collecting buoy information and data analysis of the nearby ocean at marine environmental awareness workshops. The outdoor courses included kayaking along tributaries and studying salt-water and wetland habitats. Oceanographers and marine scientists shared their current research which impacts local, national, and world economies. A teacher share-a-thon exists among educators at the annual event. The science and math instructional system specialist (ISS) has taught classes for the Center for Ocean Science Education Excellence. Having the ISS share curriculum resources, environmental materials, and invite resource persons enables Fort Stewart's "STEMposium" events to be successful. The next Charles Murray STEMposium is scheduled for April 30, 2015. Teachers have received Engineering is Elementary kits for every classroom to instruct on topics of solar energy and wind energy. Second semester workshops in the kits will include using the engineering design process to incorporate the use of solar energy. This will provide a richer student understanding of the 456 solar panels atop of the school and the wind turbine.

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

1. Describe how environmental and sustainability education at your school supports teaching science and engineering practices (e.g., 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) and supports robust general science education that includes a deep understanding of life, physical, and earth sciences. (Maximum 250 words)



The school has a half-time STEM teacher who teaches STEM lessons to the students in grades kindergarten through sixth. The STEM lessons focus on the engineering design process (EDP). This model is used throughout the district. All STEM resources are aligned to the DoDEA science standards. Engineering kits provide information about careers such as alternative energy engineering and other engineering disciplines. Students and teachers conduct investigations which allow for brainstorming and collaboration of plans as a part of the learning process. Students are expected to explain the science and mathematics engaged in their creative engineering designs. Journaling is a key feature of the science engineering project. Students keep track of the environmental data collected from the alternative energy sources. Each morning a selected student gives a daily weather report to all listeners. During the weather reports, students are encouraged to remain good stewards of the environment. Murray Elementary School is also coming online with the GLOBE program, an environmental weather program where the school's weather collection data will be forwarded to research scientists to collect and analyze. This authentic data collection provides students with background information for future careers in the STEM fields.

2. Describe how your curriculum connects classroom content to career and college readiness, particularly post-secondary options that focus on environmental and sustainability field studies and/or careers. (Maximum 250 words)

Murray Elementary School's counselor collaborated on this Green Ribbon School application and plays a significant role in ongoing events ranging from implementing the morning announcements to promoting outdoor exercises for the sixth graders daily. The counselor will play a strategic role in holding career days in the spring. Dates are identified on the annual calendar and he has asked to include engineers, scientists, mathematicians, and technologists in the planned career day event. The counselor has been invited to become a member of the STEM team to enable even more effective school-wide STEMposium planning. He is asked to promote STEM throughout the year by encouraging STEM professionals to visit as classroom guests. The guests bring 21st Century tools of their trade to share during their presentations.

Twenty-first century skills are promoted through the use of technology in science. At least two teachers have completed NASA/Georgia Tech STEM courses which allowed them to receive robotic kits. Other classroom teachers have received robotic kits and will introduce programming to students after their scheduled professional development. The planned use of 21st century tools and teaching concepts further supports the STEM focus of Green technology through robotics.

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

Murray Elementary School is moving into civic engagement in incremental steps. First, the school's second graders have participated in an energy awareness project from the local energy provider, the Touchstone Energy Cooperative, Canoochee Electric Corporation, which

provided energy awareness kits for all classes. The kits include program plans to reduce energy consumption at school and home. Company representatives will visit the school for follow-up teaching, will assist with energy audits and will provide shared energy data. The company will provide comparative data from other schools on post, and the information will be used to enable students to read tables, charts and graphs. This activity will provide students with practice applying a skill using real data.

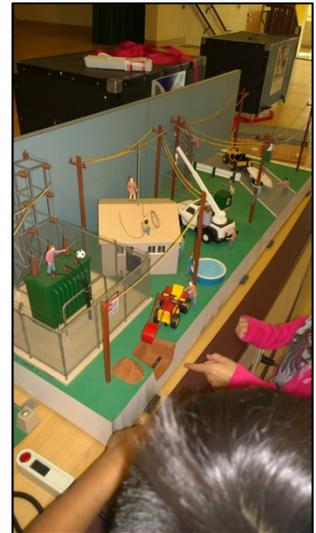
Sixth graders are writing e-letters to wind energy expert, Dr. Nick Rigas of Clemson University, a premier wind energy analyst. His chief project is to determine the feasibility of wind turbines off the Atlantic Oceans' coast along South Carolina and Georgia. Students are sketching wind turbine designs and going online to research his models. The 6th grade teacher and the mathematics and science Instructional System Specialists (ISS) have worked together to plan wind energy lessons. The plans present students with a list of wind energy companies to research and present as the better product and service.

We believe that our current and future practices of energy efficiency, healthy school environments, and environmental education make Charles P. Murray a strong contender for the Green Ribbon School Award.



Second Grade students size up a potential career in Energy Management.

2nd Graders learn Energy Safety techniques.



An Engineer briefs 6th Graders on how to conduct an Energy Audit.



Students conducting an energy audit guided by Canoochee Energy Inc. and Ft. Stewart Directorate of Public Works engineers.

Articles about Murray ES that appeared in the October 30, 2014 issue of The Frontline, Fort Stewart’s newspaper.

**Solar-powered school
nears completion**

Tracy Robillard
Corps of Engineers, Savannah District

Construction nears completion on a \$20.5 million environmentally-friendly elementary school at Fort Stewart.

Built by the U.S. Army Corps of Engineers Savannah District and prime contractor Sauer, Inc., the new Murray Elementary School is equipped with over 450 solar panels, a wind turbine and other sustainable design features.

"We are very excited to deliver this sustainable, state-of-the-art school to our valued military customers at Fort Stewart," said Susan Smith, project engineer with the Corps' Fort Stewart Resident Office.

This May, the Corps will turn over the keys to the Department of Defense Education Activity—the organization that operates DoD schools across the globe.

Murray Elementary School will accommodate up to 450 students (grades K-6) and 70 teachers and support staff. The 83,000-square-foot facility includes classrooms, computer labs, a gymnasium, a multipurpose "cafetorium" with a stage and a kitchen, a library and administrative offices.

The school is named after Charles P. Murray, a retired Army colonel and a World War II Medal of Honor recipient.

The project was designed by architect-engineer firm VOA Associates, Inc., to satisfy Silver-level criteria on the Leadership in Energy and Environmental design rating system.

ee SCHOOL _____ Page 5A

**Murray Elementary receives tool kit
to aid in energy conservation**

Elvia Kelly
Fort Stewart Public Affairs

Kids "Super Energy Saver" tool kits were presented to Talisha Thompson, principle of the new Murray Elementary School on Fort Stewart; and Samantha Ingram, Fort Stewart/South Carolina/DoDDS-Cuba District superintendent, by Joe Holton, who is a project manager for Canoochee Electric; and Fred Louis, who is an energy engineer from the Operations and Maintenance Division with the Directorate of Public Works, at Murray Elementary, Oct. 25. The presentation illustrates the growing partnership with Canoochee Energy.

"We have received some kits from Canoochee Energy, and we're going to be using these with our students with electricity, energy and have some project-based learning," Thompson said. "...We look forward to partnering with them."

Photos by Elvia Kelly

Steve Poulin, Sauer quality control manager, said the project will supply a portion of its own energy usage. The school is equipped with 456 solar photovoltaic panels, which will provide an estimated 153.2 megawatt hours of energy per year to augment the energy used for the building's electrical consumption, Poulin said.

It also includes 10 solar water heating panels, providing an estimated 24.9 megawatt hours per year—which is enough energy to heat about 40 percent of the building's hot water, Poulin said.

The school also includes a wind turbine, which will provide up to 1.5 kilowatts of grid-connected power, but production will vary based on wind conditions.

"The windmill feature is primarily an educational resource for students to learn about alternative energy sources," Poulin said.

Other sustainable features include enhanced acoustics per LEED for Schools 2007 requirements, and the use of low-impact development materials on the site, Smith said.

Low impact materials include dry detention ponds, which capture storm water runoff and filter out pollutants. The site also contains pervious concrete and paving materials, which allow water to pass directly through, thus reducing runoff from the site and allowing groundwater to recharge.

from Page 1A