



## 2015-2016 District Nominee Presentation Form

### CERTIFICATIONS

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#### District's Certifications

The signatures of the district superintendent on the next page certify that each of the statements below concerning the district's eligibility and compliance with the following requirements is true and correct to the best of the superintendent's knowledge.

1. The district has been evaluated and selected from among districts 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.
2. The district is providing 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.
3. OCR has not issued a violation letter of findings to the school district concluding that the nominated school district 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.
4. The U.S. Department of Justice does not have a pending suit alleging that the school district has violated one or more of the civil rights statutes or the Constitution's equal protection clause.
5. 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 school district in question; or if there are such findings, the state or school district has corrected, or agreed to correct, the findings.
6. The district 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 2015-2016 District Sustainability Award

Name of Superintendent: Dr. Aaron C. Spence  
(Specify: Ms., Miss, Mrs., Dr., Mr., etc.) (As it should appear in the official records)

District Name: Virginia Beach City Public Schools  
(As it should appear on an award)

Address: 2512 George Mason Drive, P.O. Box 6038, Virginia Beach, Virginia 23456-0038

Telephone: 757-263-1000 Fax: 757-263-1240

Web site/URL: <http://www.vbschools.com> E-mail: [aaron.spence@vbschools.com](mailto:aaron.spence@vbschools.com)

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

A handwritten signature in black ink, appearing to be "A. Spence".

\_\_\_\_\_  
(Superintendent's Signature)

Date: January 22, 2016



## Nominating Authority's Certifications

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

1. The district 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 education.
2. The district 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: Virginia Department of Education

Name of Nominating Authority: Dr. Steven R. Staples  
(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.

Date: January 27, 2016

(Nominating Authority's Signature)

## SUMMARY AND DOCUMENTATION OF NOMINEE'S ACHIEVEMENTS

Provide a coherent summary that describes how your district is representative of your jurisdiction's highest achieving green school efforts. Summarize your strengths and accomplishments, being sure to cover equally all three Pillars. Then, include concrete examples for work in every Pillar and Element. Only districts that document progress in every Pillar and Element can be considered for this award.

## 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 [ed.green.ribbon.schools@ed.gov](mailto:ed.green.ribbon.schools@ed.gov) according to the instructions in the Nominee Submission Procedure.

OMB Control Number: 1860-0509

Expiration Date: March 31, 2018

### 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](mailto: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.

## Summary Narrative/Abstract

For over twelve years VBCPS has been moving towards a more sustainable model. Three overarching goals drive sustainability throughout the division:

1. Develop a sustainable building infrastructure.
2. Integrate sustainable practices throughout the division.
3. Educate the public about sustainability.

**Goal #1** is achieved on new construction by designing new buildings to meet LEED certification. To date we have completed (8) LEED buildings ranging from basic certification to Platinum. Hermitage Elementary School opened in 2005 as the first LEED Elementary School In VA. The Renaissance Academy is the first LEED Gold Alternative Education Facility in the country. The Pupil Transportation and Maintenance Facility is the first LEED Platinum Transportation Maintenance Facility in the country, and College Park Elementary School is the first LEED Platinum Elementary School in Virginia. All total VBCPS has 1.6 million SF of LEED Building space. The ninth LEED project is currently under construction and the tenth is in design. Goal #1 addresses existing buildings through performance contract work and Energy Star Certification. Since November 2008 VBCPS has spent \$14 million in Performance contract work. This has resulted in \$1.8 million in cost avoidance each year. VBCPS currently has 31 Energy Star Buildings. Since FY06 VBCPS has increased in size by approximately 9% to over 10.6 million SF. During this time, energy use per SF has decreased by 24%.

**Goal #2** is monitored and implemented through the Sustainable Schools Committee (SSC). The SSC is comprised of representatives from various departments across the division. i.e. Custodial Services, School Plant, Transportation, Facilities, etc.. This group is responsible for implementing and monitoring programs like Green Cleaning, No idle, and Integrated Pest management practices to name a few.

**Goal #3** is supported by the appointment of a Sustainable School Liaison (SSL) in each school. The SSL acts as a conduit between the SSC and the school. This coordination between the SSC and the SSL is why we currently have 64 schools with outdoor teaching gardens, 72 schools with environmental clubs, and over 60 schools that partner with third party environmental organizations like the Chesapeake Bay Foundation, Lynnhaven River Now and the Elizabeth River project. Participation in various programs and initiatives are promoted through the Sustainable School Recognition Award (SSRA). Promotion of the SSRA has increased participation in the programs noted above tenfold since 2006.

Part of educating the public is making information available. In 2012 VBCPS hired an independent third party to conduct a division wide Green House Gas study. In 2015 VBCPS published a comprehensive emission reduction plan to address GHG emissions identified in the 2012 report. This information, along with the 2015 division wide Sustainability Report can be found online at [www.vbschools.com/sustainable-schools](http://www.vbschools.com/sustainable-schools) .

## **Crosscutting Questions**

VBCPS Currently has (8) completed LEED Projects along with a current inventory of 31 schools that have received Energy Star Certification.

Since 2008 VBCPS has received 38 awards related to sustainability. Some examples below.

- 2015 Project of Distinction, Kellam High School (CEFPI, ranked top five new schools in the world)
- 2015 HRACRE Award of Excellence, Best Educational Facility, Kellam High School
- 2015 Green School Challenge Platinum Award (Virginia School Board Association)
- 2015 District of Distinction Award (District Administration Magazine)
- 2014 Green School Challenge Platinum Award (Virginia School Board Association)
- 2013 Green School Challenge Award (Virginia School Board Association)
- 2013 Crystal Award in Sustainability, VCU Conference on Energy and Sustainability
- 2012 Best Green School District in the U.S. , USGBC
- 2012 Green School Challenge Platinum Award (Virginia School Board Association)
- 2011 Green School Challenge Platinum Award (Virginia School Board Association)
- 2010 Green School Challenge Platinum Award (Virginia School Board Association)
- 2010 EPA Mid Atlantic Environmental Achievement Award
- 2008 Governor's Environmental Excellence Award

The Sustainable School Committee meets quarterly to discuss these issues. Representatives from each department within the school division, students, faculty and staff are represented on the committee. PLP training is held once a year to discuss sustainability initiatives. This is open to all staff. Staff can also visit the sustainable schools intranet site to post comments and access resources on sustainability. In addition, for the last four years VBCPS has planned and sponsored the Hampton Roads Sustainable Living Expo (HRSLE). The expo is a daylong event that educates the general public on sustainability initiatives throughout Hampton Roads. This event is free and open to the public with an average annual attendance of 2000 people.

VBCPS was also instrumental in the planning and implementation of the 2015 Green Schools National Conference (GSNC). The GSNC is the only national conference focused on sustainability in K-12 education.

## **Goal Area 1: Reducing Environmental Impact and Costs Element**

### **Energy Savings**

In addition to having a dedicated full-time Energy manager, VBCPS has a “Utilities Management Plan” that addresses the use of energy, water, and other resources from a management, employee, and support services perspective. A copy of this can be provided upon request.

Since our reference year of FY2007, we have reduced our energy use by 24%/sf, while increasing our square footage by approximately 9%. By converting the electricity and natural gas reduction to GHG equivalents (using the EPA’s GHG Equivalency Calculator), we have demonstrated a more than 17% average annual reduction in GHG emissions (from 136,892 metric tons of carbon dioxide equivalent (CO<sub>2</sub>e) to 116,043 CO<sub>2</sub>e) from reduced building energy use *alone*. This is equivalent to the removal or more than 4,200 passenger vehicles from the roadways each year. A combination of strategies has been implemented, focusing on how we building our buildings, how we maintain our buildings, and how we operate in our buildings. From building energy-efficient facilities to using energy-driven performance contracting to perform major improvements in our existing buildings, to the use of “team cleaning” and four-day weeks during the summer, we have reduced our energy use significantly. In FY2007, our energy use was approximately 10,677 BTU/student. In FY2014, it was approximately 10,085 BTU/student. Our energy reduction is documented in both the Energy Star Portfolio Manager, and Utility Direct, our utilities management software.

The percentage of on-site-renewable energy is negligible when compared to the entire division. However, the wind turbines at the VBCPS Pupil Transportation facility provide approximately 10% of that buildings energy use. In addition, solar hot water systems in several schools, along with photovoltaics in four schools provide some renewable energy and engage students as valuable teaching tools. EPA has designated VBCPS as a “Premier Member” of Energy Star’s Certification Nation. In addition, the driver’s education vehicle at Ocean lakes High School is a Ford Cmax hybrid gas and electric. The charging station at OLHS incorporates solar PV and wind in the charging station. Students at OLHS participated in the design of the charging station.

VBCPS has renovated 1.6 million sf of LEED building space within the last 10 years. This includes (2) LEED Platinum projects, (2) LEED Gold, (2) LEED Silver, (1) LEED Certified, (1) Pending LEED Gold, (1) Pending LEED Gold under construction (1) Pending LEED Gold in design.

Heat Island for Roof and site are addressed on all new projects. All new Roofs as well as all existing re-roof projects are designed with cool roof systems. The heat island for the site is addressed with plant material and tree canopy coverage.

### **Improved Water Quality, Efficiency, and Conservation**

All elementary schools sites are irrigation free. Some Middle Schools and All High Schools require irrigation. Great Neck Middle School and Kellam High School are the last two schools VBCPS has constructed that require irrigation. Both schools are irrigated using rainwater collected from the site. All plant material used for site landscaping and rain gardens are indigenous. In addition, The majority of the school gardens use rain barrels to capture rain water for irrigation.

All new construction is designed to handle, at a minimum, a ten year storm on site. This exceeds local code requirements. Both College Park ES and Pupil Transportation facility will handle 100 year storms. Rain gardens, vegetative roof systems, pervious pavers and underground rainwater storage are all employed

during new construction to mitigate stormwater run-off. These items are all as tools that connect STEM and the built environment to the classroom.

No lead is allowed to be used on site during construction of new facilities. All but one of the Division's facilities is fed by the City of Virginia Beach's Public Utility system for drinking water. This water is tested regularly for quality as required by the Safe Drinking Water Act. One school, Creeds Elementary School is a Class VI Waterworks system, fed by a private on-site well. This water is disinfected by a direct injection chlorine system, and is tested regularly for a number of potential contaminants, including bacteria, lead, nitrates, and other compounds.

64 of the 85 schools across the division have outdoor teaching gardens. All new schools have rain gardens and designated Natural habitat. The City of Virginia Beach has conducted a city wide urban tree canopy study. VBCPS uses this data to determine the percentage of tree canopy on each school site. Each year Landscape Services expands the no mow zones division wide.

### **Reduced Waste Production**

School Board Policy 3-67 States "Specify, as a minimum, 30% recycled content paper in lieu of standard office paper for all purchases"

Recycling material is collected at each school. Every classroom and every office has a blue bin for recycling. Recycling is tracked at each school and listed on an excel spreadsheet.

- Since September 2008 VBCPS has diverted 8,900 tons from the waste stream.
- This is the equivalent to saving:
  - 1521,830 trees
  - 3,462,200 gallons of oil
  - 26,900 cubic yards of landfill space
  - 35,960,000 kw of energy (enough to power 4,495 homes)
  - 62,930,000 gallons of water

While many schools compost at the school garden level. VBCPS is currently conducting whole school composting at two pilot school locations.

School Plant conducts training sessions each year with science teachers to help them review their current inventory and properly get rid of chemicals that need to be disposed. During this process, they are told to check with all departments at their school to determine if there are other chemicals and materials that can be collected at the same time. School plant works with each school to ensure that chemicals that need to be disposed are inventoried, collected, and disposed properly. This "cradle to grave" management of chemicals is documented and the paperwork maintained by school plant.

All hazardous waste is disposed of through the VBCPS Environmental and Energy Management office. Waste is minimized through consolidation or use at other locations. All hazardous waste requiring removal is disposed of through an annual service contract with a hazardous waste company to ensure proper disposal. An example would be that all fluorescent light bulbs are crushed in a certified bulb crusher and disposed of through the annual contract with the waste company. We also train HS &MS teachers as far as maintaining their inventory and making sure that they send us a list of material to be disposed (and check throughout the school if there are any other departments/classes that may need materials disposed to help minimize travel).

VBCPS has a formal Sustainable Practices Plan. The plan serves as the US Green Building Council (USGBC) LEED submittal to demonstrate the intent for a “green cleaning & housekeeping” innovation credit has been met for all Projects. All cleaning products are certified as either Green Seal or EPA DFE. Antimicrobials are the only exception. There is no “Green” certification for antimicrobials. School Board Policy 3-67 states: *Promote the use of “Green Seal” certified cleaning products in conjunction with environmentally sustainable cleaning practices throughout the school division.*

In addition, VBCPS has a Sustainable Purchasing Best Practices Guide. This guide seeks to support purchasing decisions that can:

- Lead to life cycle cost savings
- Conserve natural resources and minimize pollution
- Eliminate or reduce environmental health hazards within VBCPS and our larger community
- Create increased efficiency for students and staff while supporting excellent customer service and educational requirements
- Support locally produced goods and services
- Support vendors who reduce environmental impacts and are socially responsible in their production and distribution systems or services
- Educate ourselves, our vendors, and our end users

## **Use of Alternative Transportation**

VBCPS has implemented a division-wide no-idling policy which is monitored utilizing GPS. In the Bayside section of the city, improvements to the infrastructure are underway to support Safe Routes to School which will service 5 schools.

Use of a four tier schedule,( high school, elementary A,, elementary B, and middle school) which allows for maximum utilization of assets and the reduction of fuel and emissions. In addition, all new schools have preferential parking designated for fuel efficient vehicles and carpooling.

## **Goal Area 2: Improving the Health and Wellness of Students and Staff**

### **Integrated School Environmental Health Program**

VBCPS has a written IPM that has been sent to VDACS and Va. Tech for review in accordance with the State of Virginia code. Each school has an IPM manual which contains a yearly treatment calendar, site floor plan, pest monitoring log, pest sighting log, inspection report and MSDS of approved VBCPS chemicals.

While each indoor air quality situation is handled on a case-by-case basis, we follow the recommendations of the Tools for Schools program. On a preventative basis, School Plant employs three environmental staff specialists at varying levels of management, and they are trained that anytime they visit a building, there is special attention paid not only to the specific issue that they are addressing, but also to look for other, previously unidentified potential air quality issues. Additionally, buildings are under a 6-month surveillance cycle for asbestos under the EPA’s AHERA program; the staff performing this work is directed to look for potential air quality

issues and identify remediation action.

In addition:

VBCPS builds all new buildings to meet the following LEED Indoor Environmental Quality criteria:

IEQ C4 Low Emitting Materials

IEQ C5 Indoor Chemical & Pollutant Source Control

IEQ C10 Mold Prevention

VBCPS also has a very rigorous Green Housekeeping policy.

Smoking of tobacco or vapor-type cigarettes is prohibited on school property. Mercury thermometers are also not permitted in science classrooms. Two personnel are trained as 40-hour HazWopr workers in case mercury or any other hazardous material is encountered. They can address small spills, or if there is a larger spill, contract with our hazardous waste contractor, who can also perform cleanup operations. Exterior play equipment is constructed of plastic or non-CCA-containing material. Virginia Beach is a low radon potential areas; however, after any new construction, buildings are tested for radon to ensure that no granite or other materials may be sources. Asbestos-containing material is managed in strict accordance with the EPA's AHERA policy. Additionally, more than 20 maintenance personnel are trained as Asbestos Supervisors to immediately respond in case material is disturbed or needs to be disturbed as part of a maintenance activity. Fuel-burning operations, such as from generators or bus loading/unloading are located away from outdoor air intakes. Maintenance personnel have been trained as lead renovators in general accordance with the EPA's RRP program. Other areas where there may be incomplete combustion (such as natural gas points) are monitored with carbon monoxide sensors. Any renovation that may affect painted surfaces includes testing for a number of potential hazardous materials, including lead.

HVAC systems have filter changes every 45-60 days. During that time, systems are checked for operation and cleanliness. Major HVAC systems are cleaned on a regular basis; these are done in general accordance with the manufacturer's recommendations for the specific systems. Additionally, VBCPS has a preventative maintenance program on major mechanical systems, which not only includes the aforementioned cleaning and filter changes, but also checking operations of the system to ensure that they are operating at designed efficiency. Diffusers are dusted by custodial services one a month.

Laboratory, technical education, and other such activities are only permitted in those areas that are specifically designed and constructed for that purpose. Any operations that may generate vapors or fumes are designed with dedicated HVAC system, and generally, local exhaust systems are present as well.

VBCPS follows the procedures noted in Asthma Friendly Guidelines and Tools for Schools, including the use of green chemicals for cleaning, Integrated Pest Management Procedures, an aggressive chemical management program, active management of staff and students with specific allergies and investigation of all complaints by the office of Environmental and Energy Management. For situations where there may be specific allergies with students or staff, we work with them to address their specific concerns or allergic triggers. The response is on a case-by-case basis, and may range from deployment of air cleaners, to specific allergen testing and remediation, to relocation, or any combination therein.

While each situation is handled on a case-by-case basis, we follow the recommendations of the



Tools for Schools program. On a preventative basis, School Plant employs three environmental staff specialists at varying levels of management, and they are trained that anytime they visit a building, there is special attention paid not only to the specific issue that they are addressing, but also to look for other, previously unidentified potential air quality issues. Additionally, buildings are under a 6-month surveillance cycle for asbestos under the EPA's AHERA program; the staff performing this work is directed to look for potential air quality issues and identify remediation action.

In addition:

VBCPS builds all new buildings to meet the following LEED Indoor Environmental Quality criteria:

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IEQ C10 Mold Prevention

VBCPS also has a very rigorous Green Housekeeping policy.

The office of Safe Schools has a specific process for lab chemicals, and staff is trained each year. Custodial Services has an integrated Pest Management plan and Green Cleaning/ Chemicals program.

Indoor relative humidity is maintained below 60% in all schools. Moisture resistant materials/protective systems are installed on all new projects. Maintenance and Custodial Staff are directed to address any potential moisture problem immediately, *before* it can become a mold amplification situation. For situations where remediation may be warranted, we generally follow the EPA guidelines for *Mold Remediation in Schools and Commercial Buildings*. More than 20 of School Plant's maintenance personnel have been specifically trained in mold remediation for activities that may be less than 100 square feet. For larger mold remediation activities, VBCPS has two firms that they contract, both of whom are trained under the Institute of Inspection, Cleaning, and Restoration Certification (IICRC).

## **Nutrition and Fitness**

All schools are encouraged to participate in the school based Governors Nutrition and Physical Activity Scorecard and Awards program to monitor progress on student wellness.

VBCPS participates in the yearly Virginia Farm to School Week. The past several years we have been able to receive more "local" produce especially in the spring. A Poster is updated each year and posted in all cafeterias illustrating what produce is purchased within a 400 mile radius of VBCPS.

VBCPS currently has 64 schools with outdoor teaching gardens. Produce grown in the gardens can be introduced in to the classroom or cafeteria through a chain of custody form that has been approved by the department of Food Services for use in all schools. The outdoor teaching gardens supplement nutrition education across the school division.

School Board Policy 7-27 established a Health Advisory Board consisting of 20 members including but not limited to parents, students, health professionals and educators. The Health Advisory Board assist staff with development of school health policy, the evaluation of the status of school health, promotional health education, special health needs, the school environment, nutrition and overall health services.

All student health forms and Health Services information is located at [vbschools.com/health](http://vbschools.com/health).

School Board Regulation 5-58.1 defines a comprehensive nutrition education program which provides knowledge of nutrition combined with strategies to promote healthy eating habits. Employees responsible

for nutrition educations participate in professional development activities to deliver an accurate nutrition education program. Nutrition is integrated into curriculum across the division. Nutrition education involves sharing information with families and the broader community to positively impact students and the health of the community with a focus on strategies to improve nutrition.

VBCPS will provide information to families that encourage them to teach their children about health and nutrition and to provide nutritious meals for their families.

The school division participates in the National School Breakfast Program.

Nutrition education involves sharing information with families and the broader community to positively impact students and the health of the community with a focus on strategies to improve nutrition.

VBCPS will provide information to families that encourage them to teach their children about health and nutrition and to provide nutritious meals for their families.

### **Elementary School K-5**

Students are given an opportunity to participate in a health and physical education five days per week for thirty minutes with a total of 150 minutes weekly.

### **Middle School –Grades 6, 7 and 8**

Health and physical education is available to all students at the middle school level, with students in grade 8<sup>th</sup> having the option to opt-out if an alternative program is approved. Students receive 12 weeks of health and 24 weeks of physical education with a total of 225 minutes weekly.

### **High School –Grades 9 and 10**

Health and physical education in grades 9 and 10 are required credits for graduation. Students receive 2 weeks of health and 2 weeks of physical education with a total of 450 minutes weekly.

All new buildings are designed with shower facilities for staff to encourage alternative means of transportation, such as running or bicycle. This also encourages the staff to use onsite wellness facilities.

VBCPS partners with the local Buy Fresh Buy Local community, as well as Whole foods to promote good nutrition. Whole foods allows School gardens to sell produce at the whole foods farmers market. Students keep all of the proceeds. This is a great way to provide a tangible connection for students on the social, economic and environmental systems that comprise sustainability. In addition, all produce that is purchased by the school division within a 400 mile radius is tracked and printed on a poster displayed in each cafeteria.

Some VBCPS nurses have graduated from the Virginia Coordinated School Health Leadership Institute at Henrico Training Center in Richmond. In addition, the VBCPS Health Service Program follows the Virginia Department of Health (VDH), and Virginia Department of Education (VDOE) school health guidelines, and has an established VBCPS Health Services Manual which includes, procedures, protocols, and guidelines for nursing staff and other employees. The VBCPS Health Coordinator of Health Services collaborates with the VDH and VDOE school Health Specialist, Virginia Beach Public Health Department Medical Director, and the area children's health care providers and organizations.

Each VBCPS school has a full time nurse. All schools support health screenings by school nurses for vision, hearing, blood pressure, scoliosis, height, weight, dental, skin integrity, and overall

general health, based on state guidelines and requirements and according to local school division protocol. In addition, a comprehensive school counseling program is used to educate students to be knowledgeable, responsible, socially skilled, healthy, caring, and contributing citizens. In Virginia Beach City Public Schools, prevention programs to address mental health have focused on strengthening resiliency in our students and helping them to know there is always a supportive adult in school to whom they can go to for assistance when personal or social concerns become overwhelming. This mission is supported by a number of school-based prevention and youth development programs which include activities that help students to be accepting and respectful towards others.

### **Goal Area 3: Providing Effective Environmental and Sustainability Education**

#### **Shared Responsibility for Environmental Learning**

One example would how schools participate in performance task related to the City of Virginia Beach's strategic Plan to increase the Urban Tree Canopy (UTC). Students examine data from 2009 and 2014 aerial surveys to identify patterns and make an action plan for the school grounds. The task has been in place for 2 years. Evidence from local assessment results indicate an increase in proficiency in objectives related to Earth's resources from students who participate in this task, including use of dichotomous key and recognition of the importance of trees in managing storm water.

Virginia Beach City Public Schools is involved in a grant funded partnership with a focus on environmental literacy which has a direct impact on secondary science teachers. In addition, the middle school science curriculum contains problem-based learning units that focus on key features found in the school divisions' LEED certified buildings. Finally, a physical science curriculum unit with an emphasis on work and power through wind power is being created to coincide with the building of off-shore wind turbines in the local area.

Virginia Beach City Public Schools has partnered with the Chesapeake Bay Foundation through an Environmental Literacy grant. This partnership which has been in place for four years will be in effect until 2017. Yearly cohorts are created through a teacher selection process. The teachers in the cohort receive training in environmental literacy concepts and use this training to create division-wide professional development opportunities for all secondary science teachers.

Curriculum units incorporating science concepts with features found in sustainable school buildings and the local environment have been developed for use division-wide. The Physical Science course contains a curriculum unit for Heat and Energy transfer in which students design a geothermal heat pump system for an elementary school. The Life Science course contains a curriculum unit with an emphasis on the design of zero run-off parking lots. Finally, a Physical Science curriculum unit is being developed to teach work and power through the design of a wind turbine.

VBCPS has integrated environmental and sustainability concepts throughout its instructional program and across the various subject areas and grade levels. Some examples are listed below:

1- The year-long theme is "Patterns". The Patterns in Nature "unit" focuses on the importance of natural resources and identifying natural cycles. It is integrated with language arts and lasts an entire quarter.

2- The year-long theme is "Systems". Students learn the concept of systems throughout their units, including observing a living system (with interactions, patterns, inputs/outputs, and what makes it functional or

dysfunctional). Systems in Nature Unit focuses on the relationship among living and nonliving things in an ecosystem (including humans)

3- The year-long theme is “Structures”. Students learn the concept of structures throughout their units, including two science-themed units called Structures in Nature 1 and Structures in Nature 2. The first unit focuses on a problem in an ecosystem and how it affects food chains. The second unit focuses on natural cycles and human impact on ecosystems. Most teachers design a learning garden for the school, considering how natural cycles and humans impact the success of the garden.

4- The year-long theme is “Relationships”. Science and social studies are integrated through Earth Science and Physical Geography as students focus on how humans and the natural environment affect each other.

5- The year-long focus is “change”. Students focus on change over time in a variety of ways, focused specifically on environmental issues related to electricity (energy efficiency), sound/light (acoustics, light pollution, etc.), and plants.

A sustainability course is offered each year for PD to all VBCPS employees. This course updates staff on new sustainability initiatives as well as training and partnership opportunities. There is also an Optional PD for K-5 teachers (open to ALL teachers) is available quarterly. PD for elementary science and social studies relates to specific upcoming units which feature at least one environmental/sustainable education topic throughout the year. Elementary science and social studies coordinators are also partnering with VB Sustainable Schools to plan large-scale PD in January related to sustainability education. In addition, Third party organizations such as Chesapeake Bay Foundation and Lynnhaven River Now conduct professional training throughout the year.

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Elementary science and social studies has partnered with a number of community partners including Lynnhaven River Now, Virginia Living Museum, Chesapeake Bay Foundation, Parks and Recreation, the Virginia Aquarium, the Military Aviation Museum, Back Bay Wildlife Refuge, False Cape State Park, Buy Fresh, Buy Local, the Virginia Beach Public Library, the Virginia Beach Farmers Market, our own Sustainable Schools, and many more. We have also worked with community organizations to found Virginia Beach HERO (History Education Resource Opportunity). We work with local organizations to provide programming related to our local history, focusing on civil engagement. In addition, VBCPS engages architects and engineers in partnering with local schools. Design teams and consultants are routinely engaged in exploring the connection between STEM and the built environment. This engagement takes place one on one in the classroom, as well as through skype sessions from the construction site. Even work with performance contractors has an educational component. For the past six years VBCPS has worked with a behavioral scientist, through performance contracting, to develop sustainability curriculum for the classroom.

VBCPS utilizes design team resources in unique ways. We expect all architects, engineers and consultants working on our projects to provide an educational component to their work. For example, the behavioral scientist employed by one the ESCOs has worked with teaching and learning to develop geothermal curriculum, and a wind energy course that is used to teach “Work, Force and Motion” to middle school students. We have also utilized the behavioral scientist to conduct division wide surveys to all staff and students regarding overall sustainability issues. During construction, VBCPS skypes in throughout all phases of the construction process to the classroom. This provides students with a more comprehensive look at construction than most architects and engineers get. For example, one of these sessions allowed students to witness concrete being delivered to the site. Students witnessed the testing agent sampling the concrete for

water, temperature and slump. Students can ask question during the event and witness the concrete being placed in the footings. 28 days later we skyped in from the testing lab so the students could witness the 28 day breaking of the concrete cylinders. Just in this one example, students were able to use complex math calculations and apply many basic STEM lessons. Skype sessions have been performed on everything from geothermal well system installation, to storm water management techniques and rainwater collection systems.

### **Use of the Environment and Sustainability to Develop Science, Mathematics, Engineering, and Technology Content**

Virginia Beach City Public Schools vision states, “Every student is achieving at his or her maximum potential in an engaging, inspiring, and challenging learning environment.” With this in mind, we strive to offer rigorous and relevant courses to all of our students. The oceanography curriculum focuses on environmental issues, such as sea level rise, overfishing, and pollution. The Advanced Placement curriculum provides students with opportunities to analyze issues and problems associated with the environment and to examine possible solutions to these issues. Students are required to examine interrelationships in the natural world. The percentage of students who completed the Advanced Placement Environmental Science Course is 59% and the percentage scoring 3 or higher is 42%.

Virginia Beach City Public Schools highlights sustainability and the environment through the project- and problem-based learning in the integrated areas of science, technology, engineering, and mathematics. Students engage in curriculum-related sustainability issues when working with the Lynnhaven River Now and the oyster restoration projects. In addition, rain barrels, green houses, and learning gardens help students to understand the environment and its effects on local produce. When possible, local data shapes real-world problems in mathematics; whereas, the integration of computers, laptops, tablets, probes, and other devices enable students to engage in the content. Through all of their work, students use the engineering design process and process journals to guide and reflect on their learning.

In October, 2014 the VBCPS school board approved a Sustainability two year course. The course in development and will be housed at the LEED Gold Renaissance Academy building and open to all eleventh and 12th grade high school students. The two year Career and Technical Education course sequence will enable students to study sustainability and renewable energy technologies. Additionally students in the course will be able study and take a nationally recognized industry Sustainability credential provided by the Green Education Foundation. VBCPS already has the most students in the country who have passed this credential, the new course will only add to that number. Students will have the opportunity to apply for a one credit transcript through Adam State University for a nominal fee.

Virginia Beach City Public Schools’ environmental and sustainability program is aligned to the Virginia Standards of Learning. At the middle school level, students review literature on environmental sustainability and evaluate the ways in which the environment affects them at home, in schools, and in the community. Also, students analyze environmental issues associated with ecosystems and ecology. At the high school level, students analyze natural processes that deal with earth and biological systems to evaluate and analyze man’s impact on the environment. In addition, students examine the interrelationships between various systems and how they operate in an effort to make informed decisions about the environment.

VBCPS follows the Chesapeake Bay Agreement policy, which states that all students will have meaningful watershed educational experiences within their K-12 career. On the school division level, we are in the 4<sup>th</sup> year of a partnership with the Chesapeake Bay Foundation for the environmental literacy program. Through this program, cohorts of teachers are provided with instruction and issues affecting the Chesapeake Bay Watershed and public policies affecting the local environment. As a result of this training, participating teachers train other teachers in the division through our professional learning program. Over 90% of our student body receives meaningful watershed experiences.

### **Development and Application of Civic Knowledge and Skills**

Several division curriculum activities across grade levels include explorations of the school grounds. For example, as a hook for a Problem-Based Learning unit on designing a zoo exhibit based on the natural habitat of a particular ecosystem, second graders tour the school grounds on a “nature walk” to observe living and nonliving things in the schoolyard. In fourth grade, students conduct a tree inventory, identifying types of trees using a dichotomous key from Virginia Tech and calculating economic benefits the trees provide using a Tree Benefits Calculator. From there, students analyze data from all schools in the division based on their percentage of Urban Tree Canopy cover in 2008 and in 2014 to create a plan for addressing the issue of UTC at the school and in the community.

An example at the elementary school level takes place at Grade 4 science/social studies curriculum. This curriculum includes a series of objectives about human impact on the environment in a unit called “Relationships in the Physical World”. While this is part of division curriculum for the entire year, this culminating unit includes a research project where students investigate a specific positive or negative impact humans have on the environment (more detail available upon request).

Another example that can be found across all grade levels is the Pearl School Program that over 50 schools participated in last year. Through the Pearl School Award program, schools work with Lynnhaven River Now to earn points by carrying out programs and service projects in and through their schools that teach environmental concepts and include an emphasis on our watershed, its unique characteristics and problems. Students are encouraged to take an active role in tackling some of our environmental challenges through service projects in their schools and community.

All schools throughout VBCPS have established community partnerships with organizations like Lynnhaven River Now, Elizabeth River Project, Chesapeake Bay Foundation, VB Parks and Recreation, Buy Fresh, Buy Local, as well as local military groups. Many of these organizations attend and conduct teacher professional development meetings, the coordinators work with committees for school outreach, and VBCPS staff regularly connects teachers with community partners as “experts” when students are working on sustainability tasks such as Problem-Based Learning activities.

Last year Virginia Beach partnered with the James Madison University Center for Wind Energy to host the regional KidWind challenge at Kellam High School. Regional winners went on to compete and win in the National Kid Wind competition held in Washington D.C. Students from all grade levels competed in the competition.

Virginia Beach City Public Schools’ environmental and sustainability program is aligned to the Virginia Standards of Learning, which is age appropriate for a particular grade level. At the middle school level, students review literature on environmental sustainability and evaluate the ways in which the environment affects them at home, in schools, and in the community. Also, students analyze environmental issues associated with ecosystems and ecology. At the high school level, students analyze natural processes that deal with earth and biological systems to evaluate and analyze man’s impact on the environment. In addition, students examine the interrelationships between

various systems and how they operate to make informed decisions about the environment. Teachers receive ongoing professional development in embedding environmental literacy in their classrooms.

Under the Plan for Continuous Learning (PCI) as outlined in the new Strategic Plan “Compass to 2020: Charting the Course. Students’ growth in Environmental Learning experiences and community social learning experiences are tracked across all grade levels.

As part of the Virginia Beach City Public Schools Compass to 2020, strategic plan for student success, all schools are required to incorporate sustainability education at each grade level. The Department of Teaching and Learning is currently working on the process through which teachers will determine whether a student qualifies as:

**NOVICE**

Take actions to maintain and improve the health of an environment based on information, prompts, and good citizenship.

**DEVELOPING PROFICIENCY**

Demonstrate basic understanding of the impact of human behaviors and natural phenomena on the environment through examination of data and personal actions.

**PROFICIENT**

Analyze consumption patterns, energy sources, and economic factors to determine how individuals, companies, and governments work to improve the health of an environment for future generations and use that analysis to create a compelling vision for collective action.

**ADVANCED PROFICIENT**

Apply knowledge of the dynamic interdependence of economic, environmental and societal factors to research and develop new ideas/products that will impact consumption patterns and improve environmental conditions.