



District Sustainability Award Nominee Presentation Form

CERTIFICATIONS

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 and sustainability 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 District Sustainability Award 2019-2021

Name of Superintendent: Dr. Steven L. Walts

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

District Name: Prince William County Public Schools

(As it should appear on an award)

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

Steve Walts
(Superintendent's Signature)

Date: December 4, 2021



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. Anne Petersen

(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.

A handwritten signature in black ink, appearing to read "Anna M. Petersen".

Date: February 10, 2021

(Nominating Authority's Signature)

SUBMISSION

The nomination package, including the signed certifications, narrative summary, documentation of evaluation in the three Pillars, and photos should be submitted online according to the instructions in the Nominee Submission Procedure.

OMB Control Number: 1860-0509
Expiration Date: December 31, 2023

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.



Summary Narrative: An Overview Encompassing All Three Pillars

Prince William County Public Schools (PWCS) serves over 89,000 students in 96 schools from preschool through 12th grade in Prince William County, Virginia, and is the second largest school division in the Commonwealth of Virginia. An economically diverse county of 347 square miles in northern Virginia, Prince William County is primarily a mixture of urban and suburban settings. PWCS's mission, Providing A World-Class Education, exemplifies that the School Division values the individual and that every individual can learn.

PWCS also values and actively promotes energy conservation and sustainability, recognizing that minimizing energy consumption and related costs will maximize funds available for use in the classroom. The PWCS program extends beyond energy conservation and facilities management; and is designed to include all facets of an environmentally responsible School Division to include the health and safety of both students and staff, a robust environmental education program, and community outreach.

Established in 2012, the PWCS energy management program generates savings based on behavioral changes and operational strategic planning. Additional initiatives include increasing communication in schools about energy and water usage, energy monitoring and reporting of consumption and cost, upgrading lighting, enhancing our building automation system, and upgrading equipment. These energy conservation efforts have resulted in an average 24 percent decrease in utility costs, while the total square feet of the buildings have increased by 15 percent, for a total cost avoidance estimated at \$48 million. Sixty (60) of our schools have earned the Energy Star label.

PWCS believes that student-led programs engage synergies between the built and natural environment to enhance student learning. In 2015, PWCS initiated the Annual Energy and Sustainability Challenge so every school can participate and contribute to decreasing their schools' environmental impact, while learning through place-based activities. The year-long student activities are supported by a school-based sustainability coordinator who may choose from several environmental focus areas. Since inception, more than 280,000 students have participated.

Improving student and staff health involves everyone. Within our Division, continuous contributions come from physical education and health teachers, counseling staff, building maintenance personnel, nurses, and other individuals. The PWCS well-being program, BeWell, strives to provide *World-Class* well-being to all PWCS staff through holistic wellness focused on physical, emotional, social, occupational, and financial health. BeWell aims to empower employees to take care and take charge of their health at work and at home through various programs and initiatives. Some supportive resources that BeWell offers are webinars, online challenges, health fairs, and much more, all focusing on the five pillars of our well-being program.

Practices are also in place to ensure that the more than 100 PWCS facilities are both sustainable and safe for students and staff. To promote a safe, healthy learning environment and to complement the energy management program, each campus annually reviews and adheres to the preventive maintenance and monitoring plan administered by the PWCS Facilities Services department, including HVAC, building envelope, water quality and conservation, chemical safety, and moisture management.

To grow a culture of sustainability, PWCS encourages the growth of socially responsible behaviors in our students and staff. This includes providing professional development and encouraging community support for sustainable practices. Each year since 2013, a Division Sustainability Summit is hosted to celebrate accomplishments and share best practices in our schools. Staff members and students from all schools can attend, they spend their time collaborating, sharing sustainable student activities, and exploring new opportunities with community partners. The August 2020 Summit went virtual, due to COVID-19 limitations.

Environmental and sustainability educational initiatives, objectives, and opportunities are imbedded across the curriculum in PWCS. In addition to advanced level course work, students also enroll in career and technical courses

focusing on workplace readiness and STEM. To support and engage students in STEM activities, since 2009, PWCS has funded a robotics program inclusive to the entire School Division – elementary, middle, and high, to include eight robotics platforms in all levels. Every elementary school in PWCS has at least one FIRST LEGO League team, with 32 percent of the students being female. Each year the FIRST LEGO League Challenge’s focus changes and introduces scientific and real-world tasks for students to problem solve as a collaborative team. Environmental and sustainability challenge topics have included: Climate Connections, Trash Trek, Animal Allies, and Hydro Dynamics, and each team of students must give a five-minute presentation on research of the topic for that year as well as solving the environmental challenge. Since the 2015-16 school year, over 2,500 students per year participate in PWCS, with an average of 13,000 hours spent in robotics.

On June 10, 2020, the PWCS School Board passed a Sustainability Initiative that recognizes sustainability as a high priority to reducing the Division’s overall carbon footprint, protecting the environment, and realizing cost savings with emerging energy technologies. The Superintendent was directed to carry out 10 objectives, including:

- Establish construction standards for design and construction of net zero buildings;
- Establish standards for procurement, installation, and operation of solar power systems;
- Recommend a standard for high performance building design specifications;
- Determine the feasibility of replacing all fossil fuel buses with electric;
- Establish a Sustainability Advisory Committee;
- Participate with Prince William County in creation of a countywide sustainability task force;
- Create measurable standards for environmental literacy in PWCS; and
- Increase site-based participation in recycling and waste reduction.

Crosscutting questions

PWCS benchmarks progress in energy efficiency and sustainability in each of the three Green Ribbon Schools pillars annually:

1. Reducing environmental impact and cost: Energy management plan, ENERGY STAR Portfolio manager, USGBC LEED Certification, Energy Use Intensity, water usage and school-based recycling, and annual energy audits and reporting.
2. Improving the health and wellness of student and staff: Prince William County Schools BeWell Program, indoor air quality investigation measurements, student illness and nurse visit data collection.
3. Providing effective environmental and sustainability education: environmental course offerings, outdoor classrooms and gardens, whole school sustainability challenges and school community partnerships.

Recognitions related to the Green Ribbon school pillars include: national recognition for the DOE Green Ribbon School – Coles Elementary School (2015), Virginia School Board Association – 1st place for Green Schools Challenge for size category (2015 and 2020), Virginia School Board Association Go Green Schools Challenge – Platinum certification (2016-2018), Silver certification since 2009. Virginia Energy Efficiency Council – 1st place in the Academic Category (2017), Prince William County - Green Community Award (2018), ENERGY STAR Certification (60 schools), 8 LEED certified schools, School District Scholarship from USGBC’s Center for Green Schools (2018), and the Green Schools National Network – Best of Green Schools – Marumscos Hills Elementary School (2018).

The PWCS Superintendents Advisory Council on Sustainability was established in June 2020 and had their first meeting in November 2020. The members are comprised of community members, staff, and students. The council shall advocate, examine, evaluate, recommend, and prioritize a long-term strategic plan to address Division-wide sustainability in standards for design and construction of facilities, expansion of environmental literacy, explore technologies to reduce the Division’s overall carbon footprint. The Council meetings are open to the entire Divisions stakeholders to provide input and direction for the sustainability plan.

1. Reducing Environmental Impact and Costs

Energy Savings

Striving for innovation, stewardship, and conservation, PWCS established an Energy Management Team in July 2012. All decisions to the implementation of this program are in accordance with PWCS regulation 494-1, Conservation.” In 2019, the Energy Management evolved to become the Energy Management and Sustainability Team, whose mission is to plan manage School Division energy use and sustainability, improve environmental and fiscal stewardship in facility use, and educate staff and through leadership and environmentally conscious design.

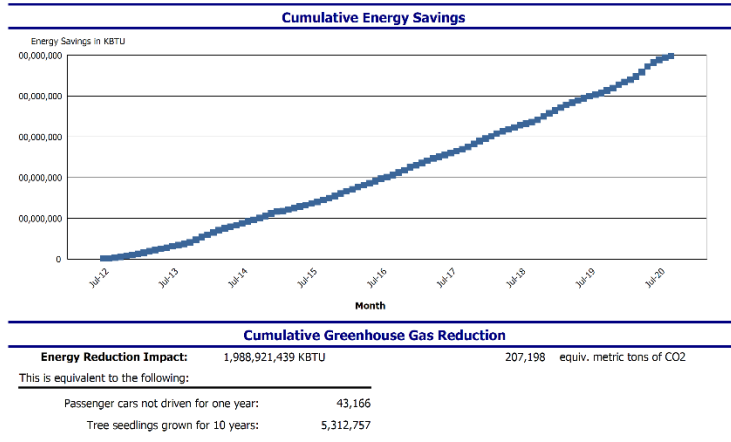


Figure 1: Energy Savings From 2012 to 2020
 PWCS cost avoided saving totaled over \$48 million, a 24% reduction in usage.

Element 1A: Reduced/Eliminated greenhouse emissions

PWCS Energy Education Coordinators work to establish accountability for energy consumption at every level in the organization. Basic areas of responsibility include administration and recordkeeping, accountability, reporting, program implementation, promoting organizational employee involvement, and validating energy management system compliance with the energy policy and guidelines. Each PWCS facility is visited annually by an Energy Education Coordinator and a report is produced with recommendations for behavior management, energy efficiency, and best practices. Work orders are written for any items that need repair or maintenance. Education coordinators remind Division employees by email to shut down computers and unplug equipment during long breaks and holidays in the school calendar.

EnergyCAP software is used to track energy and greenhouse gas data, benchmark buildings, measure and verify energy savings, create budgets and forecasts, and submit building data to Energy Star's Portfolio Manager. Using Portfolio Manager, 65 of our school buildings have achieved “Energy Star” status. An Energy Star building meets strict energy performance standards set by the EPA and uses less energy, is less expensive to operate, and causes fewer greenhouse gas emissions than its peers. By decreasing energy usage in our buildings, since 2012, PWCS has reduced Greenhouse Gas Emissions by approximately 207,000 metric tons of CO2.

PWCS has approved, and is currently procuring, building automation analytics and continuous commissioning for 95 sites. This will allow us to establish comfort and efficiency guidelines and be alerted when equipment is not functioning correctly to meet those guidelines. In addition, we are upgrading our two largest automation systems and servers. This will allow us to have better access and control over equipment, thereby increasing efficiency and comfort. This will also allow our Facilities staff to trend, troubleshoot, and diagnose quickly, both in the field and remotely.

PWCS has participated in the CPower demand response program since 2018. Because of constraints in available electrical utility capacity and required demand, utility company subcontractors manage demand response programs. Enrollment in such programs allows utility customers to voluntarily curtail usage where possible upon notification of a critical period. A rebate is provided based on the extent of curtailment pursued. In our first performance test in the summer of 2019, with 35 schools enrolled, PWCS met our load shed 100 percent. In 2020, 65 schools were enrolled in the program. By participating in the program, PWCS has saved energy costs, met our sustainability goal, and decreased energy usage.

PWCS is partnered with the Lawrence Berkley National Labs and the “BETTER” tool (Building Efficiency Targeting Tool for Energy Retrofits). Better is a public-access, data-driven tool requiring minimal inputs and short run time to benchmark buildings against peers, quantify energy and cost savings, and recommend energy efficiency improvements.

related
 “Energy Team
 and
 students

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62 elementary schools are enrolled in the program and PWCS is the first school division in the nation to use this tool. The first set of results indicated PWCS has the opportunity to save 15 percent a year on our Elementary School portfolio by implementing low/no cost strategies based on the data.

Buildings

Since 2011, PWCS has built eight new elementary schools which earned LEED certification and is pursuing LEED certification for two schools currently under construction: Potomac Shores Middle School and “Rosemont Lewis” Elementary School. The following is a list of the schools and the year built:

- Chris Yung ES (2016);
- Covington-Harper ES (2018) designed for Energy Star;
- Haymarket ES (2015);
- Kilby ES (2018) designed for Energy Star;
- Kyle Wilson ES (2017);
- Piney Branch ES (2012);
- T. Clay Wood ES (2012); and
- Jenkins ES (2019) – designed for Energy Star.

Kyle Wilson Elementary School, a certified LEED® school that opened in 2016, featured the following: rain cisterns to capture stormwater runoff for irrigation, highly reflective roof materials to reduce the heat island effect and promote a cooler building with less energy, “low VOC” paints and adhesives to reduce chemicals released into the air, and mechanical systems that have been reworked for efficiency. Low-flow plumbing fixtures resulted in 30 percent water savings compared to typical fixtures, saving 269,570 gallons of water per year. Energy saving measures resulted in a 26 percent energy cost reduction compared to a standard building. During the construction process, 82 percent of construction waste was diverted from the landfill, over 20 percent of building materials are composed of recycled material, reducing demand for virgin materials. Over 42 percent of building materials were sourced regionally, reducing the environmental impact associated with transporting materials over long distances and over half of all wood products are Forest Stewardship Council-certified, ensuring the wood was harvested using responsible, sustainable forestry practices.

PWCS is currently replacing the 30,000 existing fluorescent light fixtures with LED interior and exterior lighting in all schools, with an estimated \$2 million in utility savings and a decrease in 3,600 metric tons of carbon. The goal of the program is to be complete by 2023 and currently ten schools have been completed, with another seven schools scheduled for fiscal year 2021. Since 2018, all school renovations and additions have included LED lighting upgrades. In 2019, Mary William Elementary School was upgraded to include classrooms with color turning lights that allow the individual instructor to select the color and temperature appropriate for the current learning environment. PWCS began installing room occupancy sensors for lighting in 2011 and will continue as each building is refreshed. Outside lights dim when not in use and are night sky compliant.

The June 2020 PWCS School Board Sustainability Initiative directed the Superintendent to establish standards for procurement, installation, and operations of solar energy systems through the vector of a Power Purchasing Agreement (PPA). PWCS Purchasing Department is currently reviewing existing solar/photovoltaic (PV) contracts for adoption. The Division is considering PPA installations for ground mounts, carports and facilities roofs, throughout our portfolio. Once a contract is in place, installation is planned for a 295kW ground mount system at one of our transportation facilities. A further result of the Sustainability Initiative is the PWCS Capital Improvements Program (CIP) has been updated to include the funding for all new construction built after 2023 to include solar ready roofs.

To reduce the heat island effect from our buildings all our Middle and High Schools have white reflective membrane roofs to reflect sunlight and heat away from the buildings. Since 2015 all roof replacements and additions have a minimum of an R25 insulation, reducing energy usage for cooling and heating, and reducing air temperatures inside buildings. A 6155 sq ft section of Gainesville HS has a roof garden that can viewed from the adjacent hallways. “Rosemont-Lewis” Elementary school that is out to bid for construction has a green roof as part of its design.

As requested in the June 2020 PWCS School Board Sustainability Initiative, the following are the PWCS updated building design specifications (6.10.2020):

- Maximum Energy Use Intensity (EUI): 21;
- On-site renewable energy generation that exceeds the EUI via solar photovoltaic arrays;
- HVAC System: ground source heat pump with dedicated outdoor air system;
- Overall minimum insulation R-values: 30-roof, 25-wall, 10-under-slab;
- Thermally broken windows with insulated glass;
- Glazing percentage: 35 to 40 percent maximum;
- Airtightness: 0.15 cfm/sf; and
- Lighting System: all LED.

Element 1B: Improved Water Quality, Efficiency, and Conservation

PWCS uses EnergyCap software to track water consumption. Monthly detailed consumption data are recorded, and consumption is monitored by water meter for any changes in usage. Unusual consumption patterns are immediately investigated, allowing quickly assess, find and fix or user caused increases.

Energy Savings checklists instructions for teachers, administrators, custodians, take steps to ensure water is water leaks are reported. PWCS has reduced water consumption by 12.3 1.1 million Kgal, and water by 16.9 percent or Kgal.

PWCS has replaced all sinks

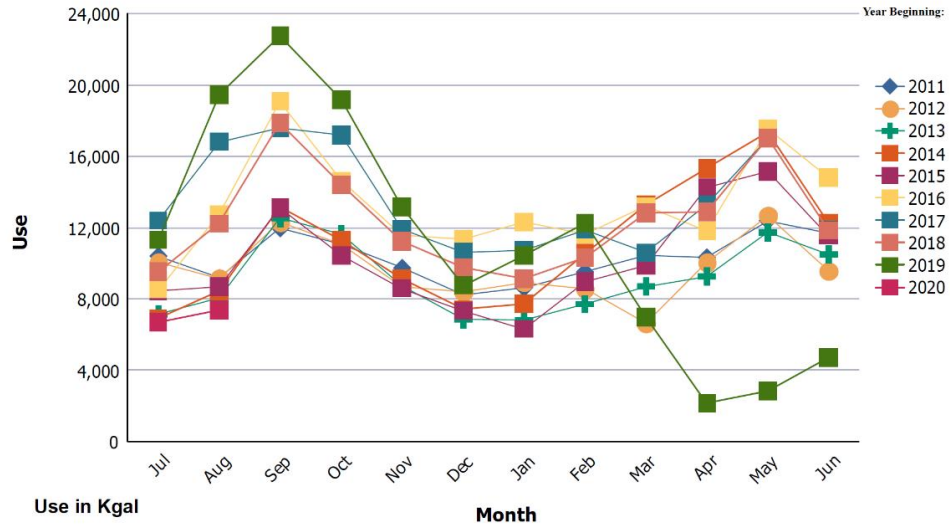


Figure 2: Water Usage PWCS has recognized 12.3% or 1.1 million Kgal reduction in water and sewer at each of our sites.

PWCS to water leaks include and staff to off and Since 2012, and sewer percent, or irrigation 374,450

and toilets with low flow/flush devices. By 2021, all

high schools have artificial turf fields to reduce water required, maximize playing time on the fields, and reduce the footprint of practice fields. Since 2012, all remodeled buildings have been provided with irrigation systems that limit water usage and over-watering. Since 2012, all eight of the newly constructed elementary schools have included installation of underground cisterns. These cisterns collect water from the roof and then store the water for use as irrigation, reducing the use of potable water for irrigation, along with the associated cost.

All of Prince William County’s watersheds drain into the Chesapeake Bay. Prince William County Schools, as required by Virginia Department of Environmental Quality, has a Municipal Separate Storm Sewer System (MS4) Program Plan to meet the requirements of 9VAC25-890-40 “General Virginia Pollutant Discharge Elimination System Permit.” The purpose of the plan is to protect the regional water quality from the impact of urban pollutants introduced through stormwater runoff and 85 PWCS properties are covered under the plan. Under the plan, the following activities are undertaken annually to reduce stormwater pollution:

- Watershed education for students in grades 1, 3 through 6, and 9;
- Custodial staff training;
- Northern Virginia Clean Waters Partnership; and
- Public involvement and participation to reduce stormwater pollutant loads, improve water quality, and support

local restoration and clean-up opportunities.

Element 1C: Reduced Waste Production

As part of the PWCS School Board Sustainability Initiative, the Division has committed to increasing site-based participation in recycling and waste reduction. To achieve this goal, the Division is developing a sustainable sourcing procurement policy and creating templates for the implementation of school-based waste management. Within the Division the use of paper has been reduced in PWCS communications with employees. Payroll stubs and the staff Communicator/Admin Instant are sent to employees electronically instead of being printed. Across the Division, outdated or unused textbooks are not thrown away, but are sold, when possible, to used textbook vendors so they may be reused.

PWCS Regulation 494-3 provides for recycling of metal and aluminum cans, plastic bottles, juice and milk boxes, cardboard, and paper. Customized indoor recycling containers are placed in all cafeterias, classrooms, workrooms, and office areas. Exterior dumpsters for single stream recycling are found at all schools and custodial staff are annually trained on materials which can be recycled in Prince William County. For 2019 approximately 1200 tons of materials from schools were diverted. Also in 2019, 9.35 tons of fluorescent tube lights, batteries, and used computer supplies and laptops hard drives was also diverted. As part of the annual Division-wide energy challenge in 2018 and again in 2019, Pattie Elementary and Forest Park High School won the Virginia division of the Keep America Beautiful Recycle Bowl. This activity requires school-wide participation to reduce waste. In addition, at least 10-15 schools participate annually in the TREX recycle plastic film program.

PWCS annually partners with the Prince William County Solid Waste Division to produce "Recycling Days." Students from the Unity Reed High School Environmental Club volunteer to host displays, tours of the landfill are given, a recycled art contest with entries from county students is conducted, and there are educational displays by local environmental partners. In 2018, the Division hosted 10 "recycle magic" assemblies during the week prior to Recycling Days. These assemblies, provided to over 3,000 students, educated through magic and music the importance of reducing waste and conserving water and energy.

In September 2020, the USDA awarded to Prince William County and PWCS a grant funding a "Community Composting and Food Waste Reduction" project. The purpose of this grant is to study the feasibility of diverting organic matter from the landfill to Prince William County's new composting facility. This effort aligns with Prince William County Public Schools' Sustainability Initiative goal of reducing landfill waste and increasing its rate of recycling. The funding will be used to create and implement a pilot composting program at six Prince William County Public Schools. The first 12 months will encompass waste audits, data collection and analysis, logistical strategic planning, and staff professional development. The second 12 months, which begins September 2021, is the implementation period where food scraps and other organic, compostable material will be collected from cafeterias, classrooms, common areas, kitchens, and major events. This material will be transported to the Prince William County Balls Ford Road Compost Facility for processing into compost. During the implementation period, students will be engaged in project-based learning activities, including learning about ecological cycles, the benefits of composting, and application of compost in school gardens.

In 2017, PWCS changed the cleaning strategy in all schools, using only four Diversey, Inc. cleaning products, a hard surface disinfectant, odor eliminator, degreaser, and floor cleaner. As the products were distributed, each custodial station in our 95 schools was equipped with a product mixing station and staff were trained in the proper usage of the four products. Color coded microfiber cloths are used, washed, and reused to reduce paper waste. In the cafeterias, kitchens or wherever food is eaten a food contact surface sanitizer is used. With the use of these products, we see a reduction in water usage, chemical usage, and a cleaner environment in our schools. COVID cleaning procedures are following guidelines from both the CDC and the Virginia Department of Health. Nurses, custodians, and science departments have access to Safety Data Sheets for proper use of hazardous substances, and PWCS is landfill compliant for the safe disposal of those substances.

Element 1D: Use of Alternative Transportation

PWCS Transportation Services Bus Driver and Attendant Handbook stipulates an anti-idling policy for school busses. This minimizes air pollution and saves fuel.

PWCS annually participates in two “Safe Routes to School” days. These two days and their associated activities bring schools and communities together as they enjoy sustainable transportation and physical activity. In 2019, twenty PWCS middle and elementary schools participated in the International Bike to School Day held in the spring. Forty-eight BMX bikes (provided, in part, by a grant from VDOT) were awarded to participants on Bike to School night. Thirty-three elementary, middle, and high schools participated in the International Walk to School Day held in the fall. This was a 60 percent increase of activity from 2018.

PWCS has been selected to receive two electric school buses through an innovative program by Dominion Energy. Electric buses will save money by eliminating the use of diesel fuel, as well as reducing operation and maintenance costs. Dominion Energy will pay for the installation of charging stations that will be required to operate the electric buses. In addition, to lower operation and maintenance costs, the electric school buses will have a positive environmental impact by reducing the carbon footprint. Dominion Energy estimates that one electric bus reduces carbon dioxide emissions by 54,000 pounds per year.

2: Efforts to Improve Health and Wellness of students and Staff

Element 2A: An Integrated School Environmental Health Program

PWCS monitors environmental conditions in buildings, investigates and resolves problems in a timely manner, and ensures compliance with OSHA and EPA regulations.

To avoid insects and animals, in school buildings and on the grounds, PWCS has an Integrated Pest Management (IPM) program that begins with maintaining clean buildings, the single most effective way to control infestation with pests. Involvement is required by the entire staff, with a goal of pest control without pesticides. If pest management is required, a work order is sent from the specific school and tracked. The IPM team is staffed with highly trained and licensed professionals who use methods such as trapping, screening, and caulking to control and eliminate pests. to minimize student exposure. Steam cleaning and power washing are also often used to ensure the health and safety of the students and staff of PWCS. If the use of chemicals is necessary, they are approved by the EPA and are applied after school hours, to minimize student and staff exposure.

PWCS HVAC systems use three types of filters with MERV ratings between eight and 14. Pleated filters are changed quarterly, and box filters and bag filters are changed annually. The filters are Energy Efficient rated per ASHRAE 52.2-1999 and 52.2-2012. To ensure moisture control in the buildings, humidity levels are monitored throughout the schools using Building Automation Systems (BAS) which are monitored by the BAS team in the Office of Facilities Services. If humidity levels exceed 60 percent in a space, the HVAC unit will automatically switch to a dehumidification mode until the detected level is below 55 percent.

The PWCS Office of Facilities Services annually performs inspection on all HVAC equipment, along with running combustion analysis on each burner assembly for proper operation. CO is monitored with sensors in all mechanical rooms with fuel combustion appliances/boilers. In large building spaces such as gymnasiums, cafeterias, auditoriums, and libraries, carbon dioxide levels are monitored 24/7, and flushing occurs if the levels exceed 700 ppm above outdoor air. Smoking is prohibited in all buildings.

Within the PWCS school buildings the classrooms are tested for radon, during the seven and 14-year building refresh, whenever a renovation or addition occurs, and in new construction after the building is occupied. The test consists of a standard three-day test which is then sent to a lab for analysis by the PWCS Environmental Services Team, within the



Office of Facilities Services. If radon is found at 4.0 pCi/L or above, the test is repeated, the HVAC unit is tested for correct working order, and the area is retested for 90 days and remediated.

Safe drinking water for students and employees is a priority for PWCS. To ensure the water quality of drinking water in our schools, PWCS tests every water spigot in each school every three years. This rotation ensures the water is “lead-free”. If lead is found in the water test, the unit is shutdown, filters are installed, the spigot is replaced, and the unit is retested. In addition, in 2020, PWCS committed to installing bottle fillers in every school, to make drinking water consumption convenient, to promote the use of reusable containers, and reduce the use of single-use plastic water bottles. At this time over 100 units have been installed.

PWCS cultivates partnerships with schools, families of students with allergies, students with allergies, and healthcare providers so to limit students’ contact with all offending allergens. The parents/guardians are asked to work with the school to create an “Asthma Action Plan” or care plan for each student identified with asthma or allergies. School nurses work to be proactive in preventing allergen related incidents by discouraging teachers from using scented plug-ins, from taking students outside when pollen is at its peak, and in classes with students who have problems with perfumes, the school nurse occasionally asks teachers/students to refrain from wearing colognes/perfumes. To minimize food allergies, PWCS does not serve products with tree nuts, and peanut butter has been replaced with sun butter. For students with known allergies to peanuts, classmates are discouraged from bringing items with peanuts to school. Classroom teachers display signage that is easily visible and communicate with classroom families regularly to ensure the safety of all students. School maintenance (painting, spraying pesticides, and cutting grass) is avoided when school is in session.

School nurses are employed at all schools. PWCS nurses accommodate clinic visits for illness, minor injuries, and dispensing medication. School nurses also collect any medications that are expired or not picked up by students at the end of the year so they can be disposed of properly through a drug Take-Back initiative hosted by the local hospital and police department. Annual Health Screening is conducted each fall by the school nurse and clinic volunteers, including vision and hearing screening of all kindergartners, third-graders, seventh-graders, tenth-graders, and newly enrolled PWCS students. In addition, they provide health services, education to students, staff, and parents, identify health and safety concerns in the school environment, and support healthy food services programs.

Mold issues are addressed through a work order submission. Mold areas less than 10 square feet can be cleaned off a surface (wall, desk, etc.) and no further action needs to be taken. Carpets are only cleaned with water extraction in cooler winter months when humidity is lower, promoting quick drying to avoid the formation of mold. Ceiling tiles with mold are replaced and the HVAC unit or other type of leak is repaired.

Chemical Storage rooms are organized and maintained according to Flinn Scientific guidelines. Outdated chemicals are picked up from individual buildings through work order submissions and then disposed of by collaboration with the Prince William County Landfill. Science staff are required to complete a seven-hour Flinn Lab Safety course and then receive three additional refresher hours per year. Safety Data Sheets, maintained electronically for ease of access and updating, are available to custodians, nurses, and science teachers.

The PWCS Mission supports academic, social, and emotional needs of all students. In June 2019, the School Board committed to a school environment in which students are free from bullying by adopting regulation 733.01.1, “Bullying of Students.” The regulation requires the school administrator to take appropriate steps to prevent bullying and to deal promptly and decisively with reported incidents of bullying. No Place for Hate® is an education initiative that is part of the Anti-Defamation League (ADL) with over 1,600 participating schools across the country. Since the launch of No Place for Hate® in 2016, over 20 schools in Prince William County have participated in the initiative, empowering students, staff, and family members to promote positive school climates and take a stand against hate and bullying. In 2018-19, seven schools were honored by the ADL for their participation. The following year, 30 schools participated in No Place for Hate® and 26 were honored for pushing the No Place for Hate® message of respect and inclusion throughout their school and community.

Element 2B: Nutrition and Fitness

Students receive nutrition and fitness education in alignment with the Health and PE Standards of Learning. Physical Education teaches students skilled movement, movement principles and concepts, personal fitness, responsible behaviors, and physically active lifestyles.

An aquatic center, recently constructed at Colgan High School, is available for swimming lessons. The center is working to prevent drownings through the PWCS Water Safety School. This program provides free swimming instruction to PWCS second grade students and utilizes the American Red Cross Learn-To-Swim curriculum. Since opening the facility, approximately 10,000 students have participated in the program.

PWCS annually participates in both the Walk-to-School-Day in October and Bike-to-School-Day in May. Both Safe Routes to School programs build community awareness of walkable communities and recognize the positive health effects of building physical activity into daily routines. Prince William County Fire and Rescue and Police Department both assist with coordinating the support for the two days. In 2019, 21 PWCS schools participated in the spring and 30 schools participated in the fall events.

PWCS is committed to school environments that promote and protect children’s health, well-being, and ability to learn by supporting healthy eating and physical activity. In 2006, the PWCS School Board approved Wellness Policy 275-1 and a Wellness Plan. The content of the Wellness Plan includes nutrition and physical activity guidelines, nutrition education goals, and staff wellness initiatives. All schools and central departments work towards the continued sustainment of this plan. As described in the Wellness Plan, each school forms a Wellness Committee composed of staff and community members. These committees provide resources and leadership in creating a healthier school and community by enhancing student, staff, and community awareness to support making healthy lifestyle decisions.

PWCS’s staff well-being program, BeWell, initiated in 2019, strives to provide *World-Class* well-being to all PWCS staff through holistic wellness focused on physical, emotional, social, occupational, and financial health. BeWell aims to empower employees to take care and take charge of their health at work and at home through various programs and initiatives. Some supportive resources BeWell offers are webinars, online challenges, health fairs, and much more, all focusing on the five pillars of our well-being program. Due to COVID 19, restrictions, and a January 2020 rollout most activities were limited, but have been revised this year virtually. The next step at the end of the 2020-21 school year will be an evaluation of the programs for effectiveness on physical health and emotional well-being of staff. In addition, since 2020, a fitness center with cardio and weight training equipment is available Monday through Saturday, free to all PWCS staff members at the Kelly Leadership Center.

PWCS students may take part in the Walk Smart, Virginia! program. Participants are provided with a pedometer to record the number of steps taken each day. They can then enter the steps walked on a map of Virginia and review Virginia history, geography, government, and recreation information along the route. The website also includes a steps-to-miles converter, a body-mass index calculator, and links to nutrition and physical activity websites. The Governor’s Physical Activity Awards Program is promoted for staff and teachers. Schools and/or individual participants who keep track of progress and reach their yearly goals will be eligible for a bronze, silver, or gold award.

PWCS School Food and Nutrition Services provide lunches at school that are selected based on the healthiest choices for the children. They are low in fat, sugar, and salt. PWCS participates in the USDA School Breakfast Program which is fully accessible to all students enrolled in school. In a typical school year, free and reduced-price meals are provided to students who meet income requirements in a manner that ensures these students are not identified by others. In 2016, the “Supper Program” was implemented at one school site, to increase access to meals and to help reduce childhood hunger ensuring at-risk students in the county have access to three nutritious meals each school day. The program is fully funded under the Child and Adult Care Food Program (CACFP), so meals are free for anyone under the age of 18. Schools can participate in the program if more than 50 percent of students in their respective school qualify for free or



reduced-price meals. The “Supper Program” has since grown to 18 sites, increasing the number of meals to 165,000 for the 2018-19 school year.

PWCS purchases from Virginia farm-to-school vendors for seasonal fruits (cantaloupe, strawberries, nectarines, watermelon) and vegetables (asparagus, bibb lettuce, broccoli, tomatoes, squash, corn, pumpkins, peppers). Go Green Fundraising and Partners for Healthy Kids are two companies used to offer healthy fundraising choices for clubs and teams. As part of the Farm to School initiative, in September throughout the county, elementary schools second grade students participate in the annual corn-shucking contest. The event is sponsored by PWCS Food and Nutrition Services and provides fun, hands-on and meaningful connections for students to support their learning about plants. The contest teaches students about the edible parts of plant, where food comes from and what everyday items are made from corn.

The HealthierUS School Challenge was established to recognize schools that are creating healthier school environments through their promotion of good nutrition and physical activity. The program encourages all to take a leadership role in helping students to make healthier eating and physical activity choices that will last a lifetime. Twelve PWCS schools put in the hard work to make changes to their school nutrition in order to: improve the quality of the foods served, provide students with nutrition education, and provide students with physical education and opportunities for physical activity. Loch Lomond Elementary School earned the highest award, the Gold Award of Distinction.

Brentsville High School, Freedom High School, Independence Nontraditional School, Potomac Middle School, and Parkside Middle School each operates its own greenhouse. In 2020, Brentsville High School could not hold the annual plant sale that has taken place at the school since the mid-1990s, due to COVID-19 restrictions. Instead, they had a modified sale named “Pay What You Can If You Can,” asking people to donate what they could for the plants if they were able. Most of their plants were sold, approximately 550 were donated to community members in need, and several community members offered to donate some of their home-grown produce to local food banks.

Flu shots are offered free to all PWCS staff members. The number of positive COVID tests for staff and students are updated weekly on the Virginia Department of Health Dashboard and used to make decisions about in-person versus online school policies.

3: Efforts to Ensure Effective Environmental and Sustainability Education

Element 3A: Interdisciplinary Learning about the Key Relationships among Dynamic Environmental, Energy, and Human Systems

The PWCS Energy Management Program was created in 2012 to reduce energy usage and conserve resources. PWCS invested in three Energy Education Coordinator positions and one of their goals was to change the behavior and culture in schools and facilities by explaining and teaching energy management practices, conducting facility audits, and looking for opportunities to energy savings and conservation. Over the last eight years, the PWCS Energy Management team has evolved and began helping schools take ownership of their individual energy and sustainability programs. Each school has a Sustainability Coordinator who serves as an ambassador of the Energy Management Program, conveying the message of environmental awareness at their school or office. Each Sustainability Coordinator is encouraged to create opportunities for student-led activities within the environmental studies of energy conservation and sustainability. To provide opportunities for collaboration and fellowship, the Energy Management team has hosted an annual Sustainability Summit since 2013. Each school is encouraged to send their Sustainability Coordinator, staff members, and students who receive information on the current year’s sustainability initiatives, new strategies to integrate and embed sustainability into their curriculum, obtain resources, and connect with community partners. To support learning in all schools, the activities and materials have been formatted for the PWCS Virtual Learning Management System and can be accessed by students in all schools as either ancillary opportunities or embedded in the curriculum.

Every year since 2015, PWCS has hosted an annual Energy and Sustainability Challenge to support the activities of the Sustainability Coordinators, encourage student-led activities, and provide rebates money for school sustainability



programs. The Challenge guidelines require activities in a minimum of three curriculum areas including: Energy Conservation, Waste Reduction and Recycling, and Water Conservation. The primary curriculum for the Challenge is based on the Project Learning Tree (PLT) Greenschools!, which is a national program characterized by high quality instructional materials for grades PreK-12, carefully designed professional development, and student-led school-based activities. The GreenSchools! program inspires students to apply their STEM and investigative skills to create greener and healthier schools and save schools money. Students learn they can make a difference in the world as they are empowered to make changes and take ownership of their projects to reduce their school's environmental footprint. The Challenge has been well received by the schools and since 2015, more than 280 thousand students have participated. Patriot High School, who has annually participated in the challenge since 2015, created an outdoor classroom surrounding their onsite pond in the fall of 2019. The Sustainability Coordinator used the challenge rebates, local volunteers, and students to build the classroom area.

Since 2018, PWCS has hosted environmental and sustainability assemblies for our elementary schools to provide a visual and auditory engagement on the topic of sustainability. The students and staff are treated to an hour-long, live, "EcoHero Show." Brett "Mr. Eco" Edwards, is an educator and environmentalist, who performs a lively show combining rap, hip-hop music, and dance to engage and educate students about energy conservation, water conservation, waste reduction, and recycling. These assemblies are held in the fall and coincide with the startup of the annual Energy and Sustainability Challenge. In 2020, the assemblies were held virtually for 10 schools.

At the elementary, middle, and high school level, a minimum of one Meaningful Watershed Educational Experience (MWEE) enables students to participate in hands-on environmental learning about the Chesapeake Bay watershed. In PWCS, the goal is for every student to graduate with the knowledge and skills to act responsibly to protect and restore their local watershed. MWEE is organized into three phases: (1) researching and discussing a watershed issue or problem in preparation for the field component, (2) observing, measuring, or collecting data during their outdoor experience, (3) reflecting upon, analyzing and reaching conclusions about their project. As an example, Potomac Middle School students visit the PWCS Eastern Area Grounds for Learning Environmental Science (EAGLES) Center to learn the importance of how watersheds filter out pollutants and how to keep pollutants from reaching the Chesapeake Bay. As part of the field trip, the students visit Belmont Bay Wildlife Refuge, and participate in interactive activities demonstrating the teamwork required to manage wetlands.

A variety of courses have been offered for staff over the years to assist them in providing age-appropriate environmental education experiences for students. These courses include topics such as school gardens, general environmental science, and energy, water, and waste audits. Since 2017, over 120 PWCS staff members have completed the U.S. Green Building Council (USGBC) Green Classroom Professional (GCP) program. The GCP certificate program provides pre-K-12 educators and school staff with the knowledge to identify what supports or impedes healthy, resource-efficient and environmentally sustainable learning spaces. This national program was tailored for PWCS staff by the Energy Management Team, with content specific modules on best practices to support energy and water saving practices, create a healthier classroom for students, teachers, and school staff, provide the best environment for student success, and engage students in green practices that impact their school and community.

In fall 2019, the PWCS Energy Management and Sustainability Team began developing environmental science activity books for elementary students in grades K-5. The first book of the five-part sustainability activity book series was published in the fall of 2019. The books are available to PWCS students, free of charge, either as digital flipbooks or as hard copy paper booklets. With these books, students can learn about and engage in activities that explore conservation of resources and sustainability. Each book covers a different topic: Energy Conservation; Resource Conservation; Water Conservation; Waste Reduction and Recycling; and overall Sustainability. Each book introduces a unique character, that students can identify with, and each character corresponds with one of the topics. The Sustainability book features all four characters working together. The Water Conservation book is place-based, emphasizing the importance of Prince William County watersheds and their role in protecting the water quality of the Chesapeake Bay. In School Year 2020-21, due to COVID-19, PWCS has encouraged student and teacher use of the books during asynchronous lessons as well



as students sharing their learning with their household.

In September 2020, a NOAA Marine Debris Program Grant: A Community Approach to Reducing Single-Use Plastic Beverage Bottles was awarded to Prince William County Schools with project partners, George Mason University (GMU), Keep Prince William Beautiful, PWC Public Works Watershed Division, PW Soil and Water Conservation District, and the Northern Virginia Regional Commission. The goal of the 24-month project using Community Based Social Marketing (CBSM), is to raise awareness of and connect participants to waste debris ecological impacts, expand participation in clean-up efforts, and change disposable water bottle use behavior at two high schools, Patriot and Freedom High Schools. To achieve sustainable behavior, change at pilot high schools, the project partners will focus on training high school teachers and students, supporting students to develop and implement their CBSM campaigns, and expand community cleanups throughout Prince William County. The grant will provide authentic experiences for 40 students at the two schools to enhance debris connections, including laboratory and field activities, community clean-ups, and with follow-on student driven CBSM campaigns. Ten teachers from each school will attend paid professional development to understand the movement of microplastics through the aquatic food chain, explore fish collection and debris impacts in aquatic habitat, and experience GMU researchers collecting and identify biological samples. The grant supports PWCS Meaningful Watershed Educational Experiences, High School courses including Earth Science, Biology, Environmental Science, AP Environmental Science, and IB Environmental Systems. The project products include student developed videos, Barriers survey, updated Prince William County drainage maps, social media campaigns, and a toolkit to replicate the activity in additional PWCS locations.

For the past 30 years, the Prince William Soil and Conservation District annually hosts Farm Field Days at the Prince William Fairgrounds for PWCS. Fourth grade students rotate through seven barns, learning aspects of life on a farm with hands-on lessons. These demonstrations are geared to meet Virginia Standards of Learning for science. Farm Field Days is a fun and engaging hands-on approach to teaching students about the agricultural world around them and opening their eyes to the importance of protecting our natural resources.

Element 3B: Use of the Environment and Sustainability to Develop Science, Technology, Engineering, and Mathematics Knowledge, and Thinking Skills

PWCS provides students the opportunity to enroll in a broad range of courses within the area of Environment and Sustainability. The 2018 K-12 Science Standards of Learning support the Profile of a Virginia Graduate, providing workplace readiness through the development of and use of communication, collaboration, critical and creative thinking skills, and applications of civic responsibility and provide a basis for foundational concepts. Starting in 2019, Environmental Science is taught at the 9th grade level at all county high schools. Students may take Earth Science, Advanced Earth Science, AP Environmental Science, and IB Environmental Systems. The Gar-Field and Unity Reed High Schools in 2021 will provide an Environmental Engineering career program as part of their CTE course offerings. This program will require service learning, reflective project practice, and utilize the Project Lead the Way Curriculum.

In PWCS, over 50 percent of our schools have gardens, and three high schools have outdoor walking paths. Students who participate in hands-on garden classroom programs develop greater concern and awareness of resource conservation and allocation than students who do not. Student garden participants also express more positive outlooks on nature, gardening, and environmental issues.

Gar-Field High School has seven gardens, which include four outdoor classroom spaces. The gardens provide native species for a semi-annual plant sale to encourage the community to plant natives and they are maintained by the student Green Club year around. The first garden was created in 2013 and is a Native Virginia Wildlife garden. It was designed to provide food and shelter for native species, especially pollinators and birds. The next one created with a PWCS grant, is a Schoolyard Habitat garden with a large variety of native species. This garden is used as a contemplative space for students who need a place to be away from stress of school or personal issues. The Food Forest is a collection of 16 different fruit trees and berry bushes. It is used as a teaching garden to show students that they can grow their own food



and to provide food to students in need. Both the vegetable garden and the Three Sisters garden, a companion planting in the format used by Native Americans, are maintained by students with Autism. The students plant the gardens and harvest the food, then use it in their cooking classes. In 2019 a Monarch Butterfly Garden was started. It is designed to provide milkweed and pollinator plants to encourage the population growth of all stages of the Monarch and other butterflies. It is a certified Monarch Waystation and is used by both environmental science and biology classes. The Math garden is currently under construction and will have seating for two classes.

In April 2020, 287 students from 47 different elementary schools accepted the PWCS Cardboard Challenge to build new and unique engineering creations. With creative thinking and materials found around their homes, they transformed and repurposed ordinary cardboard boxes into original inventions using the engineering design processes implemented in science, technology, engineering, art, and math (STEAM) labs, classrooms, and gifted centers throughout the Division.

PWCS has many different specialty schools with STEAM programs:

The Center for Applied Science, Interactive and Information Technology (CASIIT) at Battlefield High School provides the courses and the foundational knowledge to prepare students for entry into the future world of industry and technology. The program offers students the opportunity to choose from three focus areas: Applied Science, Interactive Technologies, and Information Technology. Within each area, students then have the freedom to specialize their learning to a more personal level. Students in the Sustainability and Renewable Technologies Class were recently awarded four grants totaling \$1,100 by EcoRise. Funds will be used to enhance their outdoor classroom by planting trees and a butterfly garden, building bird boxes, installing rain barrels to catch water for irrigation, converting unused public space into a school herb and vegetable garden to be used by the Battlefield culinary class, and to improve indoor air quality and aesthetics by providing plants for interior classrooms without windows.

The Center for Environmental and Natural Sciences (CENS) specialty at Freedom High School offers a rigorous four-year program of studies designed to include strong laboratory and field investigation components. The curriculum is integrated with other educational disciplines so that students gain a greater understanding of the relationships between environmental and natural sciences and these disciplines, as well as appreciate its connection with everyday life. The program emphasizes interactive science research and projects that make use of the on-site CENS lab, greenhouse, aquarium, diverse habitats, and wet pond. Students participate in co-curricular and extracurricular activities, including community service, and become involved with business and community partnerships that enhance their understanding of environmental and natural sciences.

The Agriculture Program at Brentsville High School is a four-year program of study that includes Horticulture Sciences, Landscaping I, Landscaping II, and Turf Grass Establishment and Maintenance. It offers a hands-on curriculum designed to help students develop the necessary knowledge, skills, habits, and attitudes for entry-level employment and advancement in areas such as greenhouse and nursery production, landscape design, and turf management. Students also receive instruction in leadership development and are provided many opportunities for leadership through Future Farmers of America (FFA), the Career and Technical Education student organization for agriculture.

Element 3C: Development and Application of Civic Knowledge and Skills

As a part of the PWCS School Board Sustainability Initiative, one of the objectives was to create measurable standards for environmental literacy. In October 2020, in response to another objective, the Superintendent's Advisory Council on Sustainability was formed. This group comprised of educators, administrators, community leaders, and students are currently tasked with creating the environmental literacy measures to be incorporated into the PWCS strategic plan. The plan will be developed with feedback from stakeholders, guidance from the council and implemented systemically. Quantifiable measures of progress toward the goal of environmental literacy will be included in the expected outcomes of the plan.

For the last 14 years, the Unity Reed High School Environmental Club, and the Prince William County Green Guiding



Committee have annually teamed up to produce the Youth Ambassadors Conference on the Environment. Students from schools throughout the Division sign up to attend the one-day event with their parents. The students process through hands-on activities to learn about water treatment and quality, waste reduction and recycling, their natural environment and conservation, soil science, and biodiversity. While their parents learn about the county-wide environmental initiatives of the public works department. At the end of the day the students and their parents sign up to participate in community service projects, including cleanups, tree plantings, and restoration projects. Over 80 students from 20 plus schools attended in 2019.

Environmental and sustainability education are imbedded across the curriculum in PWCS. In addition to advanced level course work, students also enroll in career and technical courses focusing on workplace readiness and STEM. To support and engage students in STEM activities, since 2009, PWCS has funded a robotics program inclusive to the entire School Division, to include eight robotics platforms in all levels. Every elementary schools in PWCS has at least one FIRST LEGO League team, with 32 percent of the students being female. Each year, the FIRST LEGO League Challenge's focus changes and introduces scientific and real-world tasks for students to problem solve as a collaborative team. Environmental and sustainability challenge topics have included: Climate Connections, Trash Trek, Animal Allies, and Hydro Dynamics, and each team of students must give a five-minute presentation on research of the topic for that year, as well as solving the environmental challenge. Since the 2015-16 school year, over 2,500 students per year participate in PWCS, with an average of 13,000 hours spent in robotics.

Junior Reserve Officer Training Corps (JROTC) programs are cadet-run organizations that teach basic leadership, discipline, self-confidence, and encourages teamwork. Cadets are taught basic military knowledge, rules, regulations, and etiquette. Cadets are given opportunities to gain leadership roles and join JROTC teams. JROTC cadets commit to learning in four areas of emphasis: character development, leadership development, citizenship, and community service. These leaders stand out as scholars who are also involved in sports, community service opportunities, and other extracurricular activities. JROTC units are called on to serve as color guards for many community and Division-level events, including professional development conferences. There are JROTC units in nine high schools and more than 1,500 cadets Division-wide.

Adopt-a-Spot is a Prince William County volunteer program in which citizens adopt public places such as school grounds, library sites, parks, and residential common areas, and then maintain their Spot by keeping it free of litter and debris on an ongoing basis for a minimum of two years. Thirteen schools participate in this Keep Prince William Beautiful initiative, with student volunteers maintaining the areas. In addition, the students provide data to the county for the amount and type of waste and can use this activity as part of their Energy and Sustainability Challenge.

Kerrydale Elementary School students and staff and PWCS Environmental Services collaborated to plant 900 trees of many varieties on school grounds in an area that is unusable because of its hilly terrain. The trees are helping to protect the Chesapeake Bay watershed by stopping soil erosion that could harm a nearby creek, and to reduce the cost of maintenance at the school. Additional advantages of the project, which encompasses just over two acres, include the creation of an outdoor classroom and a butterfly garden.