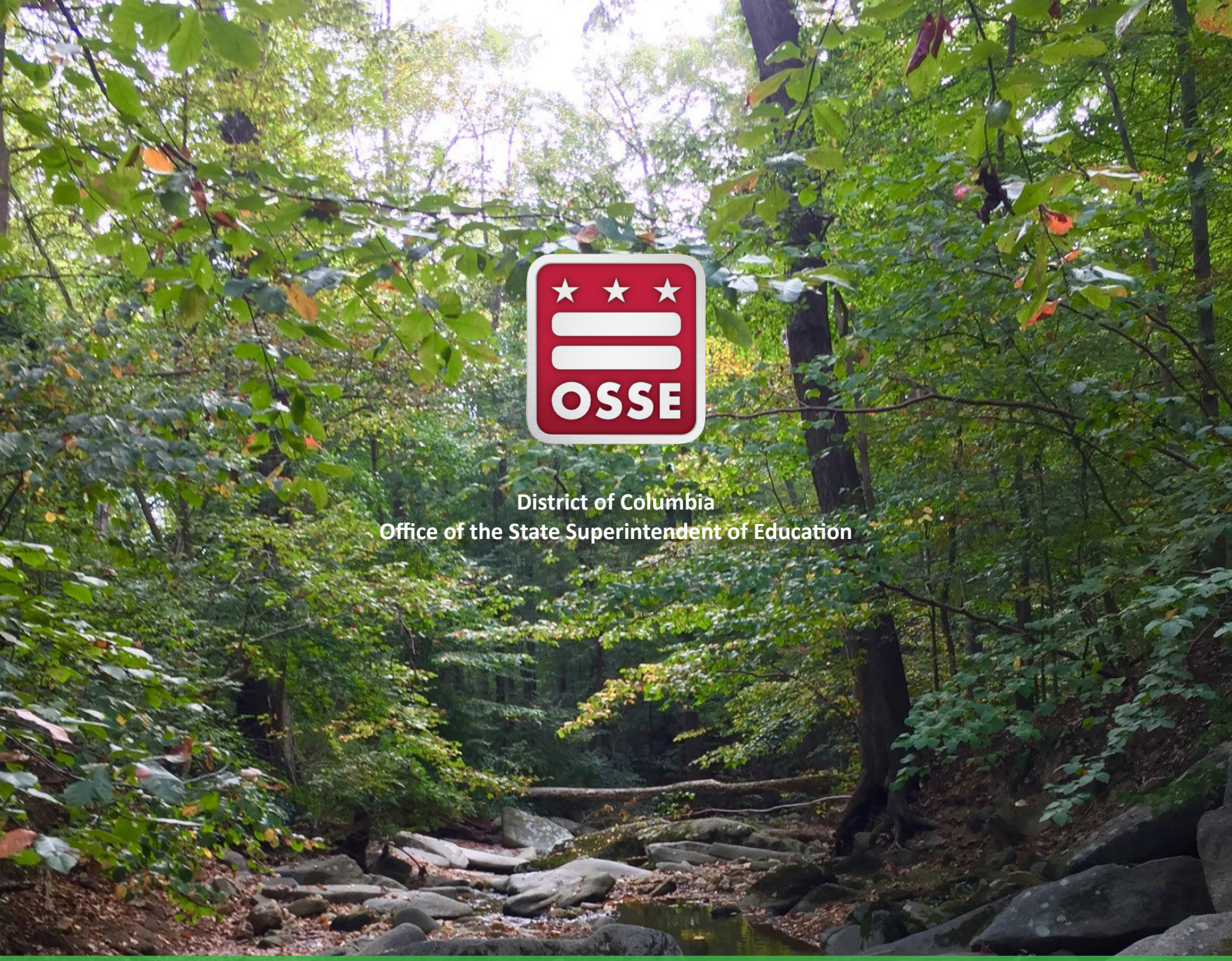

District of Columbia
Office of the State Superintendent of Education

2020 DC ENVIRONMENTAL LITERACY PLAN

Integrating Environmental Education into the K-12 Curriculum

2020 DC Environmental Literacy Plan

Prepared by the Office of the State Superintendent of Education
on behalf of the DC Environmental Literacy Plan Workgroup

Project Lead

Office of the State Superintendent of Education

Partners

Department of Energy and Environment
District of Columbia Public Schools
District of Columbia Public Charter School Board
District of Columbia State Board of Education
University of the District of Columbia
Department of Parks and Recreation
Department of General Services
Department of Employment Services

See Appendix A for a complete list of collaborators

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Department of Energy and Environment

EXECUTIVE SUMMARY

From global issues such as pandemics and strikes for climate change, to social movements such as March for Our Lives and Black Lives Matter: the world around us is changing rapidly. Today's youth - from Greta Thunberg to students at Marjory Stoneman Douglas High School - demonstrate a readiness, hunger, and desire to take action for positive change. The energy and passion youth bring to these calls for action must be informed by reliable science. Understanding how we as citizens can address, adapt, and impact the environmental and social changes of our community, nation, and world, is critical for all learners. The District of Columbia's environmental education community has worked in concert with schools, students, and families across the city to generate a thriving culture of environmental stewardship. This approach to environmental education is best illustrated by the DC Environmental Literacy Plan, which ensures that schools are creating unique and empowering opportunities both in and outside of the classroom for students to grow into environmental stewards, and gain the skills they need to flourish as future leaders.

Environmental literacy is defined as the development of knowledge, attitudes, and skills necessary to make informed decisions concerning the relationships among natural and urban systems. In the District, an environmentally literate person discusses and describes ecological and environmental systems and human impacts on these systems; engages in hands-on, outdoor learning experiences that involve discovery, inquiry, and problem solving; formulates questions and analyzes information pertaining to his or her surrounding environment; and understands how to take actions that respect, restore, protect, and sustain the health and well-being of human communities and environmental systems.

With the unanimous passage of the Healthy Schools Act of 2010, the Council of the District of Columbia (DC Council) instituted legislation that prioritized the health and wellness of students throughout the District. This landmark piece of legislation addresses poor nutrition and inadequate physical activity. It also asserts that the environment plays a central role in supporting learning outcomes and maintaining life-long healthy behaviors.

The Healthy Schools Act calls for an environmental literacy plan in the District – a road map that will lay the foundation for District-wide implementation and integration of environmental education into the K-12 curriculum. This initiative, also supported by the District's Sustainable DC Plan, facilitates the collaboration between key community stakeholders, including District education agencies, public schools in the District, environmental education providers, health advocates, and many others. The DC Environmental Literacy Plan provides a framework to further guide these efforts and ensure that District students will be prepared to make informed decisions concerning the opportunities and challenges of the 21st century.

The Office of the State Superintendent of Education (OSSE) leads this effort, and has collaborated with District agencies and community stakeholders to update the 2017 DC Environmental Literacy Plan. The plan serves to guide local implementation for regional and national environmental literacy efforts, such as the Chesapeake Bay Watershed Agreement and the US Department of Education's Green Ribbon Schools program. Combined, these initiatives seek to empower future generations to make effective environmental decisions and become caretakers of our shared community.

The DC Environmental Literacy Plan (ELP) outlines the following objectives and strategies for reaching them:

- All students engage in project-based experiences at every grade level, both in the classroom and outdoors, designed to increase understanding of environmental and sustainability concepts.
    1. Identify existing programs of study in schools that integrate environmental literacy components that lead to proficiency in environmental literacy.
    2. Provide students with exposure to green jobs and environmental careers and encourage student participation in these opportunities.
    3. Determine correlations between standardized assessment performance and implementation of school-based environmental programming.
    4. Create opportunities to demonstrate mastery of environmental literacy concepts that are not test-driven.

- All educators are prepared and equipped with sustained professional development, tools, and resources to provide rigorous instruction that continually increases students' age-appropriate understanding of the environment.
    1. Provide educators with environmental literacy instructional resources aligned with current standards.
    2. Prepare pre-service teachers to be able to teach environmental education and foster environmental literacy.
    3. Provide in-service teachers and community-based educators with workshops about how to teach environmental education and foster environmental literacy.
    4. Provide ongoing support for communities of practice to collaborate and increase capacity and implement environmental literacy programs at schools.
    5. Regularly disseminate information to encourage engagement in local, District-specific environmental education opportunities.

- All schools integrate sustainability practices and reduce the impact of their buildings and grounds on the environment and human health, including through integrated learning opportunities for students.
    1. Increase number of schools implementing environmental best practices.
    2. Include school maintenance and facilities managers/ operations staff to encourage collaboration across school building operations.
    3. Develop communication tools to create and leverage partnerships between schools and environmental providers.

- Community stakeholders collaborate across sectors to provide opportunities to teachers, students, staff, and school-based initiatives that support the environmental literacy goal.
    1. Cultivate and foster the knowledge and awareness necessary for the development and implementation of ELP at local education agencies (LEAs).
    2. Create state infrastructure for implementation of the ELP.
    3. Utilize multiple communication platforms to highlight environmental efforts.

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INTRODUCTION

In response to the growing health, educational, and environmental concerns across Washington, DC, the Council of the District of Columbia (DC Council) passed the Healthy Schools Act of 2010 (DC Law 18-209), as amended by the Healthy Students Amendment Act of 2018 (DC Law 22-240). This legislation seeks to improve the health and wellness of all students attending public schools in the District of Columbia. Specifically, the Act addresses nutrition, health education, physical education and physical activity, Farm-to-School programs, and school gardens. The Act also acknowledges that creating and sustaining an environmentally friendly school environment and integrating environmental education into the schools' curriculum are essential to the health and wellness of students, as well as the health of the local environment and community.

The Healthy Schools Act also includes provisions that incorporate environmental stewardship behaviors (such as recycling and energy reduction) into building practices; meet Leadership in Energy and Environmental Design (LEED) Gold Level certification when renovating or constructing new schools; assist schools in receiving Green Ribbon Schools recognition from the US Department of Education; and develop an environmental literacy plan for public schools, public charter schools, and participating private schools. The Healthy Schools Act Amendments of 2011 clarified the components to be included in the DC Environmental Literacy Plan and added the provision that a draft be submitted to DC Council in June 2012. In 2014, the Sustainable DC Omnibus Amendment Act further amended the Healthy Schools Act by formally adopting the plan and set for the requirement that the plan be updated every three years. The 2020 Environmental Literacy Plan is the second update to the original plan developed in 2012.

Elements of a State Environmental Literacy Plan

An environmental literacy plan creates the framework for standards, achievement, professional development, assessment, and leadership for individuals and organizations to thrive and achieve innovation in education.

The DC Environmental Literacy Plan describes the following:

- Relevant teaching and learning standards adopted by the District of Columbia State Board of Education;
- Professional development opportunities for teachers;
- Suitable metrics to measure environmental literacy;
- Suitable methods to increase environmental literacy;
- Governmental and nongovernmental entities that can assist schools in the achievement of those goals; and
- A proposed implementation method for the plan.

These components are consistent with the requirements described in the North American Association for Environmental Education (NAAEE)'s guidance document, *Developing a State Environmental Literacy Plan* (NAAEE, 2008).

Broader Perspectives of Environmental Literacy

Across the country, many states are making significant progress in advancing national educational goals by creating and implementing environmental literacy plans to enrich the curriculum with environmental education (Bodor et al., 2020). At the national level, the Every Students Succeeds Act (ESSA) includes language that makes environmental education and environmental literacy programs explicitly eligible for federal funds, specifically in two formula grant programs described in Title IV of the bill: well-rounded education and 21st Century Community Learning Centers (NAAEE, 2016). The US Department of Education continues to host the Green Ribbon Schools program - the first comprehensive green schools recognition program at the federal level. Other federal agencies continue to promote programs that encourage access to the outdoors (e.g., US Department of Interior's Every Kid in a Park Initiative for fourth grade students and their families), or funding for environmental literacy programs (e.g., National Ocean and Atmospheric Administration's Bay Watershed Education and Training grants, US Environmental Protection Agency's environmental education grants). Several national coalitions have also emerged to support initiatives complementary to environmental literacy, such as the Youth Outdoor Policy Playbook and the National COVID-19 Outdoor Learning Initiative.

Regional environmental literacy efforts are driven by the Chesapeake Bay Watershed Agreement, which asserts that the long-term success of the Chesapeake Bay restoration efforts depends on the work of individuals and communities living throughout the watershed. First signed in 1987 by the mayor of the District of Columbia and the governors of the six states in the Chesapeake Bay watershed, the administrator of the US Environmental Protection Agency, and the chair of the Chesapeake Bay Commission, the latest 2014 agreement includes the following environmental literacy goal: enable students in the region to graduate with the knowledge and skills to act responsibly to protect and restore their local watershed. This goal is measured via three outcomes: student engagement in meaningful watershed educational experiences, sustainable schools, and state-level environmental literacy planning (CBP, 2014). These goals and outcomes are based on the 2012 Mid-Atlantic Elementary and Secondary Environmental Literacy Strategy, developed by the Chesapeake Bay Education Workgroup, which outlined how the federal government should support state efforts to environmental literacy.

The District's State Environmental Literacy Plan

In the District of Columbia, environmental literacy can be found at the intersections of education, health, and environment. In the 2018 Health Equity Report, DC Health identified the outdoor environment and education as two drivers of health outcomes (DC Health, 2019). The Sustainable DC 2.0 Plan includes the Education target to teach 100 percent of children in the District about environmental and sustainability concepts by 2032. The DC Environmental Literacy Plan is the local component for these local, regional, and national environmental literacy efforts. The DC Environmental Literacy Plan is a road map that will lay the foundation for District-wide implementation of the integration of environmental education into the K-12 curriculum. This initiative facilitates the collaboration between environmental education providers, health advocates, District education agencies, and public schools in the District. The DC Environmental Literacy Plan provides a framework to further guide these efforts and ensure that students attending school in the District will have meaningful environmental education experiences and will be well prepared to make informed and responsible decisions about the environment.

Definition of Environmental Literacy

In August 2011, the DC Environmental Literacy Workgroup[1] developed and adopted the following definition of environmental literacy:

Environmental literacy is the development of knowledge, attitudes, and skills necessary to make informed decisions concerning the relationships among natural and urban systems.

An environmentally literate person:

- Discusses and describes ecological and environmental systems and human impacts on these systems;
- Engages in hands-on, outdoor learning experiences that involve discovery, inquiry, and problem solving;
- Formulates questions and analyzes information pertaining to his or her surrounding environment; and
- Understands how to take actions that respect, restore, protect and sustain the health and well-being of human communities and environmental systems.

Environmental Literacy Plan Goal and Objectives

The DC Environmental Literacy Plan consists of required elements listed in the Healthy Schools Act and the North American Association for Environmental Education's (NAAEE) guidelines. The updated 2020 plan introduces a restructured format that emphasizes the audiences around which the plan centers its activities. All action items from the 2017 plan have been reviewed, revised, and updated to reflect changes in the District's educational and environmental landscape. Table 1 describes the connections between the required elements of the environmental literacy plan and where they can be found within the 2020 plan.

Goal: All District students graduate with the knowledge, attitudes, and skills to make informed decisions and take actions that impact the community and environmental systems.

Student Objective: All students engage in project-based experiences at every grade level, both in the classroom and outdoors, designed to increase understanding of environmental and sustainability concepts.

Educator Objective: All educators are prepared and equipped with sustained professional development, tools, and resources to provide rigorous instruction that continually increases students' age-appropriate understanding of the environment.

School Objective: All schools integrate sustainability practices and reduce the impact of their buildings and grounds on the environment and human health, including through integrated learning opportunities for students.

Community Stakeholder Objective: All community stakeholders collaborate across sectors to provide opportunities to teachers, students, staff, and school-based initiatives that support the environmental literacy goal.

[1] See Appendix A in the 2012 Environmental Literacy Plan for a list of workgroup members

Table 1. Crosswalk of Environmental Literacy Plan Elements

Healthy Schools Act Required Element	NAAEE State ELP Component	2020 ELP Section
Relevant teaching and learning standards adopted by the State Board of Education	Specific content standards, content areas, and courses or subjects where instruction will take place	• Students • Educators • Appendix D
Professional development opportunities for teachers	A description of programs for the professional development of teachers	• Educators • Appendix C
Suitable metrics to measure environmental literacy	A description of how the state education agency will measure the environmental literacy of students	• Students • Community Stakeholders
Suitable methods to increase environmental literacy	A description of how state high school graduation requirements will ensure that graduates are environmentally literate.	• Students • Schools • Community Stakeholders
Governmental and non-governmental entities that can assist schools		• Community Stakeholders • Appendix C
Implementation of the Plan	A description of how the state education agency will implement the plan	• Community Stakeholders

Each objective section includes the following components:
Background and Rationale: Research that justifies the need for these environmental literacy initiatives.
Local Context: A snapshot of "where we are" in the District regarding environmental literacy.
Status: Progress that has been made since the first DC Environmental Literacy Plan.
Strategies and Action Items: A table describing what will be accomplished in the next three years.

The following District agencies and organizations will lead or partner to implement the action items found in the plan.

- Department of Energy and Environment (DOEE)
  - Aquatic Resources Education Center (AREC)
  - Urban Sustainability Administration (USA)
  - Watershed Protection Division (DOEE WPD)
- District of Columbia Public Schools (DCPS)
  - Office of Teaching and Learning
  - Office of the Chief Operation Officer (DCPS Ops)
- Local Education Agency (LEA)
- State Board of Education (SBOE)
- Office of the State Superintendent of Education (OSSE)
  - Office of Career Technical Education (CTE)
  - Division of Data, Assessment, and Research (DAR)
  - Division of Health and Wellness (H&W)
  - Division of Teaching and Learning (TAL)
- University of the District of Columbia (UDC)
- Department of Parks and Recreation (DPR)
- Department of General Services (DGS)
- Department of Employment Services (DOES)

STUDENTS

Background and Rationale

Numerous studies have shown positive links between environmental literacy, student performance, and academic achievement. A research brief by Collins et al. (2020) describes the following:

- Participation in informal environmental and outdoor science education programs results in positive cognitive/academic, dispositional, social-emotional, and health outcomes.
- Numerous physical and mental health benefits accrue from spending time in the outdoors, such as reduced stress and loneliness, and increased physical activity and resilience.
- Learners understand the impact of human activities on individual species and ecological systems firsthand through experiential activities, improving their knowledge, awareness, motivation, and critical thinking about climate change. These changed dispositions may translate into behavioral changes related to environmental stewardship and responsibility.

In March 2020, Gallup's annual environment poll[2] indicated that more Americans choose the environment (60 percent) than economic growth (33 percent) when asked which of the two should be given priority (Gallup, 2020). Young people also demonstrate similar environmental concerns. In December 2019, the Washington Post and the Kaiser Family Foundation (Post-KFF) published results from a poll of American adults and youth between the ages of 13 and 17 to assess the views about climate change (Kaplan & Guskin, 2019). Results included:

- 24 percent of youth participated in an action to express their views on climate change or global warming, such as school walk-out, public protest or rally, or contacting a government official, sometime in the last three years
- 61 percent rank climate change as an "extremely important" or "very important" issue to follow
- 86 percent are "very certain" or "certain" that human activity is causing changes to the Earth's climate (vs. 79 percent of adults). Among these respondents:
    - 88 percent think there is still time to prevent the worst effects of climate change
    - 64 percent believe that there are things they can personally do to make a difference when it comes to reducing the effects of climate change

[2] Poll conducted just as the country was beginning to experience concerns and closures related to COVID-19, but prior to government guidelines for social distancing and travel restrictions.

The Post-KFF survey also showed that the number of teenagers who say they are being taught in school how to mitigate climate change appears to be on the decline. Fourteen percent say they have learned "a lot" about the subject, down from 25 percent in 2010, when the Yale Project on Climate Change asked a similar question about global warming. The survey results raise concerns that the public may not be informed enough to make educated decisions about the environment.

At the national level, since the introduction of the College Board's Advanced Placement (AP) Environmental Science Exam in 1996, the number of students taking this exam nationwide has grown from 5,186 in 1996 to 35,208 in 2006, and to 169,690 in 2019 (College Board, 2020). However, students' scores in Environmental Science remain the lowest when compared to the other 12 AP Science, Technology, Engineering, and Math (STEM) subject exams. In 2019, almost half of students (49 percent) received a score of 3 or higher, which would allow them to receive college credit. The District's 2019 results parallel the national numbers, with 307 public school students taking the AP Environmental Science exam, and 43 percent of students receiving a score of 3 or higher.

As part of state environmental literacy plans, all states should describe a strategy to incorporate environmental literacy into their state graduation requirements (NAAEE, 2008). Several states have environmental literacy embedded into high school graduation requirements:

- Maryland requires the completion of a locally designed, state-approved high school program of environmental literacy
- North Carolina requires one high school course in earth/environmental science
- Pennsylvania requires demonstrated proficiency in the state's ecology and environment standards

Other states, such as Georgia, Michigan, New Jersey, list environmental science as a suggested course to fulfill science course requirements (ECS, 2019).

In response to the coronavirus (COVID-19)m pandemic, emerging research shows that learning outdoors may be a cost-effective way to reduce the burden on indoor classrooms while providing fresh air, hands-on learning opportunities, and the health benefits associated with increased access to nature (GSA, 2020).

LOCAL CONTEXT

According to the 2014 Chesapeake Bay Watershed Agreement, "the public will be called upon to understand complex environmental issues and be aware of the environmental effects that individual decisions can have on local and global scales." As a signatory of the Chesapeake Bay Watershed Agreement, the District committed to work towards the regional Environmental Literacy Goal, which is measured by three outcomes (CBP, 2014). One outcome directly addresses student education:

- Continually increase students' age-appropriate understanding of the watershed through participation in teacher-supported, meaningful watershed educational experiences and rigorous, inquiry-based instruction, with a target of at least one meaningful watershed educational experience in elementary, middle, and high school.

Released in 2019, the Sustainable DC 2.0 Plan is the five-year update to the 20-year plan to make the District of Columbia the healthiest, greenest, and most livable city in the nation. Sustainable DC 2.0 includes actions to achieve the

target of teaching 100 percent of children in the District about environmental and sustainability concepts by 2032 (DOEE, 2019). Relevant action items include:

- Implement the Environmental Literacy Plan.
- Provide adequate support so that every student will have access to meaningful environmental experiences in elementary, middle, and high school.
- Create new paid job opportunities in sustainability fields for young adults and high school students, focusing on populations with highest unemployment rates.

Additionally, the drafted 2020 DC Comprehensive Plan includes action items concerning education about energy, litter, and clean water education, in addition to overarching sustainability education and stewardship (OP, 2020).

In the District, educational standards and graduation requirements are approved by the DC State Board of Education. In 2010, the District of Columbia State Board of Education adopted the Common Core State Standards for English/language arts and mathematics. In December 2013, the District adopted the Next Generation Science Standards (NGSS). Based on the National Research Council's *Framework for K-12 Science Education,* the NGSS reflects the integration of science and engineering content and application as it is practiced in the real world (NGSS, 2013). These standards emphasize understanding human impact on the Earth and explaining the complex interactions among all living things and the environment. Science instruction encourages students to explore natural phenomena, conduct investigations, and utilize technology through real-world contexts for learning. In high school, District students can elect to focus on environmental issues via two of the graduation requirements needed to obtain a high school diploma in the District of Columbia Public Education System. This includes: four units of science (including biology, two lab sciences, and one other science) and 100 community service hours (SBOE, 2020).[3] All course offerings and curriculum decisions are made at the local education agency (LEA) level. Sixteen DCPS high schools and 14 public charter high schools offer AP or the standard environmental science course. These courses reached approximately 2,171 students (OSSE, 2020g).

The science standards are strong in emphasizing local, relevant applications to science content, and it is important that students have access to high quality science instruction. Students must complete four lab science courses (biology required) to graduate. DCPS scheduling requirements include the following: students in grades K-2 receive 45 minutes of science instruction per day (for the equivalent of at least one semester); students in grades 3-5 receive 30 minutes per day; middle school students must receive 120 hours of science instruction annually; and high school students must complete four credits of science, to include biology, two lab sciences, and one other science course. Principals must work with instructional superintendents to ensure these requirements are met (DCPS, 2019b). Since frequency and duration of science instruction is not tracked District-wide at elementary schools, data is not available to determine the amount of science instruction taking place at elementary schools. At some elementary schools, a principal chooses to hire a dedicated science resource teacher to teach science once a week for 45-60 minutes, while in other elementary schools, science is taught by the grade-level teacher, and the subject may not have dedicated time in the teaching schedule.

[3] Section 2203.3 of the District of Columbia Municipal Regulations (DCMR) Title 5-E, Chapter 22 (5-E 22 DCMR § 2203).

The updated DC Science Assessment, introduced in 2019, uses interrelated questions to adequately assess the Next Generation Science Standards. As seen in practice items shown in Table 2, the science assessment includes environment-based scenarios around which the item clusters are based.

Table 2. Next Generation Science Assessment Practice Items and Environmental Content Correlations

Grade and Practice Item Scenario	Standards Covered in Practice Items
Grade 5 A class goes on a school trip to learn about the types of organisms that live in a local river. They work in groups and use nets to collect organisms out of the river. A student is walking and sees acorns all over the sidewalk. The student learns that factors in both the living and non-living environment can affect the acorn mast year to year. A student reads about growing plants in water with no soil. The students' teacher tells the student that fish can be raised using the same water in which aquatic plants grow.	• 3-LS1-1 • 3-LS3-1 • 5-LS1-1 • 5-PS3-1 • 5-ESS2-1 • 5-ESS2-2
Grade 8 Students hear about a spearfishing tournament where the top prize is awarded to the team who brings back the most lionfish. They learn that lionfish are native to the Pacific and Indian Oceans and had not been seen in the Atlantic Ocean or the Gulf of Mexico at all until 1980. The lionfish population in the Atlantic Ocean has greatly increased since 2010. A student finds a rock and shows it to his teacher, who says it contains phosphate. The teacher explains that rocks containing phosphate are mined and broken down for use in fertilizers. Some students are visiting a coral reef off the coast of Florida. After conducting research, the students describe interactions in the reef ecosystem. They also learn that water temperature influences the ecosystem.	• MS-LS2-2 • MS-LS2-5 • MS-ESS2-4 • MS-ESS3-1 • MS-LS2-1 • MS-LS2-3
High School Biology A researcher investigating cattle in the Blue Mountains of Oregon observes the cattle drinking water from a local stream. The activity of the cattle muddies the water in the stream. After the cattle depart, the researcher finds that they have trampled and destroyed several fish eggs, which turn out to be from trout and salmon species listed as "threatened" under the Endangered Species Act. Scientists have observed a decrease in dissolved oxygen levels and a decrease in the level of light in the water in the pond. This seems to be happening because the water is cloudy. They conducted two experiments to test the responses of a local species of pondweed (an aquatic plant) to these changing conditions.	• HS-ETS1-4 • HS-LS4-6 • HS-LS2-3 • HS-LS2-5

Source: DC Science Assessment Practice Tests (OSSE, 2018)

In 2019, the District reported continued, steady improvement on the PARCC assessments for the fourth year in a row, up 12.3 percentage points in English/Language Arts and 8.4 in math in the percentage of students on track for college and careers since 2015. For the DC Science assessment, 2019 serves as the performance baseline, and sets expectations for the statewide science standards. The 2019 science results are lower than the ELA and math assessments (OSSE, 2019c) (see Figure 1).

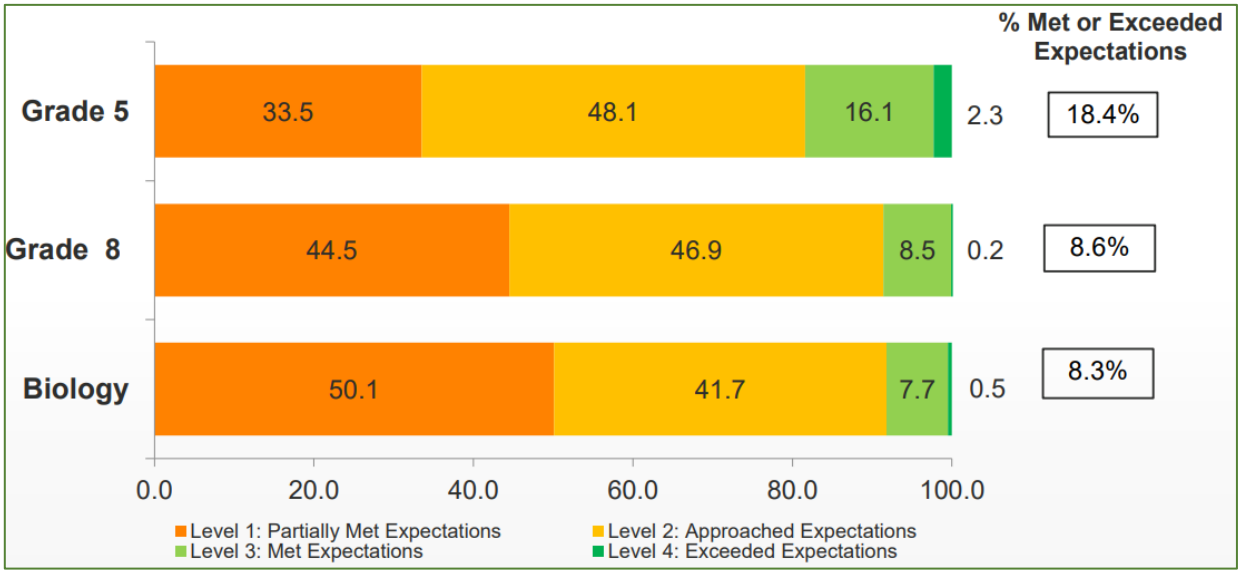

Figure 1. 2019 State Results for DC Science

STATUS

OSSE began tracking school engagement in environmental literacy in 2015 through data collected via the School Health Profile (SHP). Table 3 shows the number of schools reporting participation in environmental literacy has grown by 54 percent; however incorporating data collected through other District agency programs, such as school gardens or DGS' Recycling Honor Roll, participation has increased by 23 percent (OSSE, 2020g).[4]

Table 3. Numbers of Schools Reporting Participation in Environmental Literacy (2015-present)

Number of Schools	2015	2016	2017	2018	2019	2020
Reported in School Health Profile	46	43	68	59	105	99
Reported via other agency programs	154	172	212	203	204	201

Since 2013, the Overnight Meaningful Watershed Educational Experience is a systemic, District-wide program for fifth grade students. With funding from DOEE and transportation provided by OSSE, DCPS and charter schools are encouraged to participate in this free program that provides students with a three-day, two-night overnight field study.

[4] https://osse.dc.gov/service/healthy-schools-act-yearly-reports. Note that in 2017, OSSE's environmental literacy program began including data collected regarding whether schools participated in walk/bike to school or Safe Routes to Schools.

During the 2019-20 school year, the program was scheduled to reach 61 schools out of 114 eligible schools[5] (OSSE, 2020g).

Launched in 2015, DCPS continues to promote Cornerstones across all grades, which provide at least one signature experience in each content area. Several Cornerstones include an environmental problem or context for learning, but implementation of Cornerstones varies across the schools. Charter LEAs that practice the expeditionary learning model often include expeditions that focus on local environmental themes.

To support implementation of the Next Generation Science Standards, the Environmental Literacy Framework identifies guidance and suggestions for incorporating environmental concepts into every grade level. Most environmental literacy instruction takes place in science, but environmental literacy can also be found integrated in other subject areas, such as social studies and art, and through school-wide recycling initiatives, school garden programs, and special events (e.g., Earth day celebrations or poster competitions). Elementary schools that have participated in OSSE's Environmental Literacy Leadership Cadre have used the framework to develop a continuum of learning that includes an environmental experience at every grade level within their school.

Student exposure to environmental science and environmental careers can be fostered by increasing the number of environmental tracks, courses, and programs offered at every high school, including AP Environmental Science courses; adding environmental/engineering pathways through Career and Technical Education courses of study, NAF Academies, and Project Lead the Way pathways; and work-based and service-learning opportunities, including integrating environmental professions into the DCPS Career Bridge Program. For example, OSSE's recently updated State Career and Technical Education State Plan (2019a) includes several state-approved courses of study have links to environmental and/or sustainability careers:

- Energy and Natural Resource Technology
- Horticulture Science
- Architectural Design
- Construction Management
- Electrical Technology
- Heating, Ventilation, Air Conditioning, and Refrigeration (HVAC-R)
- Environmental Sustainability (Project Lead the Way)

In 2019, DCPS funded two high school teachers to include LEED Prep coursework in their classrooms and funded several DCPS students to take the LEED Green Associate exam before graduating high school (DOEE, 2020b). The redesign of Anacostia High School will feature a new Civil and Environmental Engineering pathway that intends to prepare students for high-demand careers, and will include implementation of a project-based learning approach that makes connections across courses and allows students to apply their learning to real-life topics in their communities and environment. The school is also partnering with the Department of Energy and Environment (DOEE) and the University of the District of Columbia to provide educational programming and other resources to support Anacostia High School's environmental focus (DCPS, 2019a). At Capital City Public Charter School, high school students engage in expeditionary learning projects that have environmental themes ranging from aquatic wildlife, water quality, and food justice (CCPCS, 2020).

[5] Forty-two schools completed the overnight experience prior to school closures due to COVID-19.

Additionally, in response to the COVID-19 public health emergency, OSSE also compiled resources for distance learning to support environmental experiences and instruction for students of all ages.

Outside of instructional time, District youth can still learn about the environment through summer employment opportunities and volunteer activities. The Department of Energy and Environment hosts the Green Zone Employment Program, which is a subset of the Marion Barry Summer Youth Employment Program (MBSYEP) that places young adults and high school students in private, nonprofit, and governmental jobs. In 2019, DOEE worked with 225 youth, with participants receiving approximately 48 hours of exposure to environmental careers through the program. Other environmental nonprofits and businesses have hosted MBSYEP participants. The Department of Parks and Recreation, the University of the District of Columbia, as well as many environmental organizations in the District currently provide meaningful volunteer opportunities to District youth to help fulfill the graduation requirement to complete 100 community service hours.

These creative approaches to exposing students to environmental science are important, since environmental science jobs are expected to grow by 8 percent from 2018-2028, faster than the average for all occupations (BLS, 2020). Additionally, 78 percent of businesses and organizations believe that the value of job candidates' environmental knowledge will increase in importance as a hiring factor (NEEF, 2016). By offering a multitude of engagement opportunities of varying degrees and depth, students will be better prepared for the demands of the future green economy.

Student Objective

All students engage in project-based experiences at every grade level, both in the classroom and outdoors, designed to increase understanding of environmental and sustainability concepts.

Table 4. Student Strategies and Action Items

Strategy	Action Item	**Lead** Partner
ST1. Identify existing programs of study in schools that integrate environment literacy components that lead to proficiency in environment literacy	a. Encourage all District high schools to offer an environmental science course (or similar course, such as urban ecology) and track student enrollment	**DCPS** **Charter LEAs**
	b. Develop course pathways to include environmental science as a recommended high school course to increase student enrollment in the course	**DCPS** **Charter LEAs**
	c. Develop and pilot an environmental-themed instructional sequence for high school biology	**DCPS** **Charter LEAs** OSSE H&W OSSE TAL
	d. Increase the number of students engaged in high quality hands-on, real world learning experiences, such as school garden programs and DCPS environmental science-based Cornerstones	**DCPS** **Charter LEAs** OSSE H&W UDC Food Hubs

Strategy	Action Item	**Lead** Partner
ST2. Provide students with exposure to green jobs and environmental careers and encourage student participation in these opportunities	a. At least 300 students per year in District summer employment programs (such as DOEE's Green Zone Environmental Program and the Marion Barry Summer Youth Employment Program) receive exposure (minimum of one day) to environmental careers	**DOEE USA** DOES DPR UDC
	b. Support the development of aligned career and technical education programs to increase students' participation in work-based learning, internships, certifications, postsecondary attainment, and careers in environmental studies	**OSSE CTE** DCPS Charter LEAs
	c. Create a pilot school ambassador program at five high schools that give green tours	**UDC** DCPS Ops
	d. Recruit a minimum of five environmental and sustainability businesses and nonprofit organizations for the DCPS Career Bridge Program to provide credit and payment for internships that build environmental skills	**DOEE** DCPS
ST3. Determine correlations between standardized assessment performance and implementation of school-based environmental programming	a. Map data between environmental literacy program participation and statewide assessments results to determine how environmental literacy affects assessment outcomes, especially in areas of science and health/physical education, to identify trends or gaps and inform future work	**OSSE DAR** OSSE H&W
	b. Identify opportunities to align environmental literacy efforts with science item development through OSSE internal team review and assessment items and specifications.	**OSSE DAR** OSSE H&W
ST4. Create opportunities to demonstrate mastery of environmental literacy concepts that are not test-driven	a. Develop recognition for student participation and engagement in environmental projects, such as a capstone project, science fair project, portfolio, school environmental competition, and provide a showcase for student presentations	**DOEE WPD** **OSSE TAL** DOEE USA OSSE H&W
	b. Catalogue efforts and utilize communication outlets to promote and recognize student achievements, such newsletters and social media	**DCPS** **Charter LEAs**
	c. Analyze the implementation and results of MWEEs in other state/jurisdictions to determine best practices and applications for the District	**OSSE H&W** DOEE WPD

EDUCATORS

Background and Rationale

Research continues to indicate that environmental education improves learning in other subjects. For the past 20 years, studies conducted by the State Environmental Education Roundtable (SEER) have shown that environment-based programs have positive effects on student achievement, classroom discipline, and student attendance (SEER, 2014). According to a literature review of 119 peer-reviewed studies published from 1994-2013 that empirically measured K-12 student outcomes associated with environmental education, environmental education has resulted in a number of positive impacts: improving academic performance, enhancing critical thinking skills, increasing civic engagement, fostering positive environmental behaviors, and developing personal growth and life-building skills including confidence, autonomy, and leadership (Ardoin et al., 2018).

According to the report *Environmental Literacy in the United States* (2015), teachers who may have little or no exposure to, or interest in, environmental topics are often called upon to teach about the environment and sustainability in their classroom. The report further suggests that from 2005-15, there have not been large advances in preparing classroom teachers as environmental educators (NEEF, 2015). A study by Ruskey, Wilke, & Beasley (2001) found that although more than half of the teachers surveyed report teaching environmental subjects, only 10 percent of teachers have had specific training on environmental education teaching methods, and only one in four has had any environmental science or related courses.

Local Context

A survey of teachers, conducted by the DC Environmental Education Consortium (2011), revealed barriers to participating in environmental education to include lack of principal support, scheduling conflicts, and the lower priority placed on environmental education compared to reading, mathematics, and test taking. A survey conducted by Chapman (2014) supports the DC Environmental Education Consortium's finding, noting similar challenges across 12 states, primarily teacher workload, lack of funding, and schedule/time constraints. Many teachers anecdotally report that many of these barriers still exist today.

To address some of these barriers, teacher resources that show how environmental literacy is connected to the required learning standards must be readily available and easily accessible. Created in 2014, the Environmental Literacy Framework is a key guidance document that depicts how the local environment can be the context through which the Next Generation Science Standards (NGSS) can be taught (see Appendix D). Using the framework as a starting point, the District continues to collaborate across OSSE's NGSS and environmental literacy implementation initiatives to streamline

efforts and leverage resources, while increasing access to resources for both teachers and nonformal environmental education providers. The framework has been used to create NGSS-aligned curricular units and instructional sequences, environmental literacy grant requirements, and school-based environmental literacy programs. In 2019, OSSE released updated Early Learning Standards, which include more robust, age-appropriate science components that are NGSS-aligned (OSSE, 2020a). Also available is a resource that explores the links between environmental literacy and the C3 (College, Career, and Civics) Framework for Social Studies State Standards (NAAEE, 2019).

In the District, there is not a centralized approach to provide system-wide professional development opportunities to prepare teachers and build confidence in teaching about the environment. For pre-service teachers, of the 15 institutions or organizations with state-approved educator preparation programs, two offer middle school general science and five offer secondary (high) school general science. None of the institutions or organizations offer an environmental science program (OSSE, 2020b). For current teachers who hold an OSSE credential, one component for renewal is the completion of a minimum of 120 professional learning units (PLUs, equivalent to clock hours of professional development activities), with a minimum of 60 PLUs directly related to the area of the credential being renewed (OSSE, 2020c). Many of the professional development opportunities provided by District agencies and nonprofit organizations qualify for Professional Learning Units. Examples include DOEE's RiverSmart Schools and aquatic wildlife programs, OSSE's environmental workshops for early educators and school garden trainings, and more.

STATUS

Various environmental education initiatives have provided teachers a platform for creating peer-developed resources that showcase ways to integrate curriculum content with real-world challenges. OSSE has capitalized on local teacher expertise via summer institutes and the Environmental Literacy Leadership Cadre to create the Environmental Literacy Framework, environmental literacy guides for elementary teachers, and high school instructional sequences (OSSE, 2020d). Over the last couple of years, the District's Department of General Services (DGS) has hosted the Recycle Right and Reduce First competitions, which focus on waste reduction. District teachers also developed curricular materials to complement the challenges (DGS, 2020). Many organizations offer standards-based resources to assist District schools with integrating environmental literacy into a school's individual curriculum. OSSE has compiled a directory of environmental organizations that provide these resources (see Appendix C).

DCPS develops Scope and Sequence documents for each grade and subject area. These documents establish consistency of instruction throughout the District—in different grade levels and subject areas—by providing clear guidance on what teachers should teach and when they should teach it. DCPS included environmental literacy resources in the 2015-16 school year Scope and Sequence documents for science and will continue to integrate them in future revisions. Beginning in the 2018-19 school year, all DCPS science teachers had access to STEMscopes, which has NGSS-aligned resources and includes environmental content where applicable. Discovery Education's Science Techbook was also still available as a supplemental resource. DCPS also continues to encourage teaching Cornerstone units, which may include environmental content and concepts. Launched in the 2015-16 school year, this program facilitates system-wide learning experiences for all students at every school, embedded in all curricular subject areas (DCPS, 2020). For teacher professional development, DCPS hosts half day sessions, which sometimes can include opportunities for partner organizations to offer elementary science sessions with environmental themes. Public charter schools have exclusive control over their curriculum and educational programs. Some public charter schools, particularly those that employ the expeditionary learning model or the international baccalaureate program, choose to weave environmental education

into their individual curricular offerings. Professional development is not coordinated across all charter schools, and each charter LEA is responsible for its own professional development for its teachers.

OSSE offers professional opportunities that are system-wide (available to both DCPS and public charter school teachers) with varying degrees of length and duration. For those interested in acquiring Professional Learning Units or other training, workshops and sessions are publicized in OSSE's Teaching and Learning Professional Development bulletin and other communication channels. OSSE is the state coordinator for training in Project Learning Tree, a suite of national environmental education curricula, and DOEE serves as state coordinator for training in Project WILD and offers free professional development in the national environmental education curricula Project WILD, Aquatic WILD, and Growing Up WILD. In 2020, 26 organizations provided professional development for District teachers in areas that support environmental literacy. These opportunities may be offered by one organization or in collaboration with other nonprofits. A listing of organizations can be found in Appendix C.

OSSE also hosts communities of practice, such as the Environmental Literacy Leadership Cadre and school garden coordinators, for those teachers motivated to dive deeper into implementation at their individual schools. Similarly, teachers participating in DOEE's RiverSmart Schools training form a team to connect outdoor classroom spaces constructed to manage stormwater into their school's curriculum.

Educator Objective

All educators are prepared and equipped with sustained professional development, tools, and resources to provide rigorous instruction that continually increases students' age-appropriate understanding of the environment.

Table 5. Educator Strategies and Action Items

Strategy	Action Item	**Lead** Partner
ED1. Provide educators with environmental literacy instructional resources aligned with current standards	a. Create a crosswalk document that identifies Early Learning Standards that include environmental literacy concepts	**OSSE H&W** OSSE TAL SBOE
	b. Update online platform yearly to include an environmental literacy-specific page for curriculum and/or resources	**OSSE H&W**
	c. Update District-wide scope and sequence document for a high school environmental science course and create a local-context curriculum	**DCPS**
	d. Provide educators with a resource guide of environmental education providers	**OSSE H&W**

Strategy	Action Item	**Lead** Partner
ED2. Prepare pre-service teachers to be able to teach environmental education and foster environmental literacy	a. Engage pre-service programs to determine how they can provide environmental education as part of their coursework (such as teaching methods) with a target of 6 contact hours of training in environmental education	**OSSE TAL** OSSE H&W UDC
	b. Identify and partner with a higher education institution to provide certification opportunities for middle and secondary teachers with a concentration in environmental science	**UDC**
ED3. Provide in-service teachers and community-based educators with workshops about how to teach environmental education and foster environmental literacy	a. Deliver at least three high-quality workshops for teachers by competent EE professionals that increase content knowledge of teachers and increases comfort with teaching outside of the classroom	**OSSE H&W** OSSE TAL DOEE WPD DOEE AREC
	b. Conduct one summer learning institute per year that provides intensive training in relevant grade bands and/or content areas, such as science, early learning, and nutrition	**OSSE H&W** OSSE TAL DOEE WPD DOEE AREC
	c. Hold at least three workshops per year for community-based organizations, to include introductory courses and supplemental workshops	**OSSE H&W** DOEE WPD DOEE AREC
ED4. Provide ongoing support for communities of practice to collaborate and increase capacity and implement environmental literacy programs at schools	a. Identify and promote best practices currently in place in District schools	**OSSE H&W** DOEE USA
	b. Create at least two Professional Learning Communities, teacher leadership opportunities, or other networks to develop environmental literacy resources	**OSSE H&W**
ED5. Regularly disseminate information to encourage engagement in local, District-specific EE opportunities	a. Develop outreach strategy, to include materials such as environmental literacy guides and fact sheets, and events such as teacher's night	**OSSE H&W** OSSE TAL DOEE WPD DOEE USA DOEE AREC DGS DPR
	b. Submit environmental literacy resources information to be published in the OSSE LEA Look Forward, TAL PD Bulletin, School Garden Monthly Newsletter, Sustainable DC Newsletter, and PCSB Bulletin at least four times per year	**OSSE H&W**

SCHOOLS

Background and Rationale

School facilities are essential to providing healthy and safe spaces for learning. As described in the CDC's Whole School, Whole Community, Whole Child (WSCC) model, the physical school environment encompasses the school building and its contents, the land on which the school is located, and the area surrounding it. A healthy school environment addresses a school's physical condition (e.g., ventilation, moisture, temperature, noise, and natural and artificial lighting), protects occupants from physical threats (e.g., crime, violence, traffic, and injuries) and biological and chemical agents in the air, water, or soil, as well as those purposefully brought into the school (e.g., pollution, mold, hazardous materials, pesticides, and cleaning agents) (CDC, 2019).

When considering the environmental conditions of the school building and protection against biological and chemical agents, research points to the benefits of "green" buildings and schools. The 2016 report from the Harvard T.H. Chan School of Public Health, *Schools for Health: Foundations of Student Success,* reviews findings from more than 200 scientific studies and describes benefits of characteristics inherent in green schools. For example, studies show that improved indoor air quality decreases asthma triggers, which decreases absenteeism, and building improvements, such as daylighting, increases student productivity (Eitland et al., 2016). Other benefits include greater teacher satisfaction with green school environments, which increases retention (AFT, 2017). According to studies by Duran-Narucki (2008) and Kumar, O'Malley, & Johnston (2008), substandard physical environments are strongly associated with truancy and other behavior problems, with lower student attendance leading to lower scores on standardized tests in English/language arts and math.

Similarly, research has shown that improvements to the land on which the school is located, such as through outdoor classrooms or school garden projects, also have positive effects on student learning and behaviors. Williams & Dixon (2013) led a review of research conducted between 1990 and 2010 that examined the impact of school gardens on academic performance. The research overwhelmingly showed that garden-based learning has a positive impact on students' grades, knowledge, attitudes, and behavior (Williams & Dixon, 2013). Dhanapal & Lim (2013) compared quiz scores after an outdoor science lesson and an indoor science lesson, and found that quiz scores after an outdoor classroom science lessons were higher. Additionally, students enjoyed and preferred learning science outdoors rather than indoors.

The US Department of Education's Green Ribbon Schools program recognizes schools that follow the CDC's building recommendations, while also aligning with additional educational and environmental parameters. Green Ribbon

Schools demonstrate progress in the following three pillars: 1) reducing environmental impact and costs, including waste, water, energy use, and alternative transportation; 2) improving the health and wellness of students and staff; and 3) providing effective sustainability education (USED, 2020). Viewed through a broader lens, green schools can include LEED certification; active school gardens that can produce food, manage stormwater, and/or provide wildlife habitat; exemplary recycling or food waste reduction practices; and an integrated environmental education curriculum.

Local Context

Given that student academic achievement is closely tied to student health, it is important that school facilities provide an educational setting conducive to learning, as well as serve as healthy environments. As a signatory of the 2014 Chesapeake Bay Watershed Agreement, the District committed to work towards the regional Environmental Literacy Goal, which is measured by three outcomes (CBP, 2014). One outcome directly addresses sustainable schools:

- Continually increase the number of schools in the region to reduce the impact of their buildings and grounds on their local watershed, environment, and human health through best practices, including student-led protection and restoration projects.

In the District of Columbia, local legislation also impacts school buildings and operations. The Healthy Schools Act of 2010 has numerous requirements that support the relationship between a school's physical environment and the academic success of its students. For example, the Healthy Schools Act amended the Green Building Act of 2006 to encourage school construction to achieve LEED gold certification. The Healthy Schools Act also mandates that there be recycling, energy reduction, integrated pest management, and other environmentally-friendly practices inside all District public school buildings. Additionally, the schools must test drinking water for lead and ensure compliance with US Environmental Protection Agency standards for indoor air quality and lead removal (OSSE, 2020e).

Released in 2019, the Sustainable DC 2.0 Plan (SDC 2.0) is the five-year update to the 20-year plan to make the District of Columbia the healthiest, greenest, and most livable city in the nation. SDC 2.0 includes provisions to create and maintain school facilities with features that support students in environmental learning (DOEE, 2019). Relevant action items include:

- Implement a program to encourage all District schools to adopt healthy, green, and sustainable practices.
- Require higher levels of energy efficiency, renewable energy requirements, net zero standards for new construction, and broader sustainability metrics for public projects.
- Retrofit and maintain all buildings owned by District government to reduce energy use by 50 percent and maximize the installation of renewable energy technology.
- Develop and support school gardens and garden-based food system education to engage DCPS and charter school students.

The District of Columbia's Comprehensive Plan is a 20-year framework that guides future growth and development. Originally adopted in 2006, it was first amended in 2011. The plan's Environmental Protection Element includes policies for energy conservation and education in schools, recycling, and schoolyard greening to include the use buildings and grounds for instructional programs in environmental science and gardening classes, as well as policies for environmental

education (OP, 2011). The 2020 DC Comprehensive Plan draft continues to include elements related to the environment and schools (OP, 2020).

Several District agencies support green school buildings and grounds in varying capacities. For example, OSSE has a school garden program that assists schools in building and maintaining school gardens, and provides training and technical assistance to teachers in utilizing school gardens as a teaching tool (OSSE, 2020f). DOEE's RiverSmart Schools program improves school grounds by incorporating landscape design principles that create habitat for wildlife, emphasize the use of native plants, highlight water conservation, and retain and filter stormwater runoff. These sites have the added benefits of an outdoor classroom that supports effective teaching practices and promotes student learning (DOEE, 2020a). DGS provides building design and construction in accordance with the LEED rating system and facilities maintenance services (e.g., heating, ventilation and air conditioning [HVAC]); waste hauling; integrated pest management; water quality testing) for DCPS school buildings. Community partners also have schoolyard greening programs that assist schools in the creation of educational green spaces, provide professional development for teachers, and conduct in-class presentations that include outdoor components. At least 16 organizations provide in-class presentations regarding indoor air quality, energy efficiency, and/or waste reduction for schools (see Appendix C).

At the LEA level, DCPS' operations office includes a sustainability specialist as part of its facilities team. This energy and sustainability liaison meets regularly with sister agencies, nonprofit partners, central office staff, and school staff to facilitate coordination and expansion of sustainability efforts, including energy efficiency, stormwater retrofits, gardens and outdoor classrooms, internal and external communications, green construction, green cleaning, recycling and composting, sustainable curriculum, tree planting grants, student and staff leadership opportunities, and connecting students with local green businesses.

Each charter LEA bears sole responsibility for its school facilities and there is no centralized contact person to coordinate environmental efforts across all charter schools. Depending on the individual charter LEA, environmental efforts might be coordinated by a facilities administrator, business manager, and/or custodial staff.

STATUS

The portfolio of schools that incorporate green, healthy, and sustainable practices continues to grow. Since 2012, the number of LEED-certified schools has grown from eight DCPS schools and two charter schools to 35 DCPS schools and 19 charter schools (USGBC, 2020).[6] The District also leads the nation in number of schools (seven) with the platinum rating. As part of Growing Healthy Schools Month, OSSE often presents a Best School Garden Award, and DCPS schools can be recognized for recycling efforts through DGS' Recycling Honor Roll.

Since 2012, the number of active school gardens has grown from 82 to 110 in 2020. Some schools may have more than one type of garden on site, and the gardens have varying degrees of use. Of the schools with gardens, figure 2 shows the percentage breakdown (by type) of school gardens (OSSE, 2020g).

[6] Excludes two DCPS sites not used for instruction.

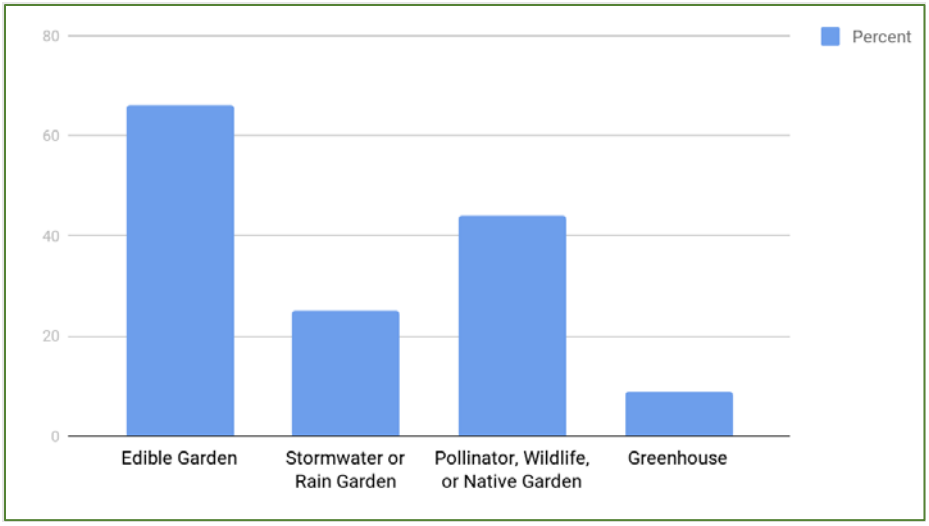

Figure 2. Percentage of Gardens by Type (SY 2019-20)

While schools have made great strides in improving the environmental impacts of their buildings and grounds, utilizing the buildings and grounds as teaching tools has not been as strong. Since 2012, the US Department of Education has recognized six schools (and one university) in the District as Green Ribbon Schools; however, no school has applied or received the recognition since 2016 (OSSE, 2019b). To support the sustainable schools outcome of the Chesapeake Bay Watershed Agreement and the Education goal of the Sustainable DC 2.0 Plan, OSSE has worked in partnership with DGS, DCPS, DOEE, and member organizations of the DC Environmental Education Consortium, to pilot a new recognition program, Capital LEAF (Leaders in Environmental Actions for our Future). Capital LEAF will recognize schools that are achieving success in environmental and sustainability outcomes in the following areas: administrative leadership, staff involvement, community engagement, and school commitment. It will also consider the extent to which schools are engaging students in conducting audits and action projects in the following areas: energy, schoolyard habitat, health and nutrition, physical environment, transportation, and waste. OSSE plans to formally launch the program during the 2020-21 school year. Capital LEAF aims to serve as a stepping stone to schools seeking recognition by the US Department of Education's Green Ribbon Schools program (OSSE, 2020g).

As District agencies continue to provide support for outdoor learning spaces, District schools will be able to extend classroom space to accommodate new considerations. For example, school grounds can be utilized as strategic, cost-effective tools for improving student academic outcomes, and mental and physical wellbeing for students and staff, as schools reopen with required social distancing measures in place (GSA, 2020). On the horizon is the reopening of West Elementary School and Banneker High School in school year 2021-22, which are targeted to be the first Net Zero DCPS schools, and would be the first Net Zero District government buildings (DOEE, 2020b).

School Objective

All schools integrate sustainability practices and reduce the impact of their buildings and grounds on the environment and human health, including through integrated learning opportunities for students.

Table 6. School Strategies and Action Items

Strategy	Action Item	**Lead** Partner
SC1. Increase number of schools implementing environmental best practices	a. Determine and provide technical support needed to increase the number of Capital LEAF schools and US Green Ribbon Schools applications	**OSSE H&W** DGS DOEE USA DCPS Ops
	b. Provide District support and partnership connections to facilitate the building, maintenance, and use of school gardens, such that 60 percent of schools will have active school gardens	**OSSE H&W** DOEE WPD
	c. Provide District support and partnership connections to maximize waste reduction and recycling, increase food recovery, and support energy efficiency in building operations.	**DOEE USA** DGS
SC2. Include school maintenance and facilities managers/ operations staff to encourage collaboration across school building operations	a. Provide, or identify an entity to provide, technical support on sustainable operations for charter LEAs related to school facilities	**DOEE USA**
	b. Develop a maintenance plan to ensure school gardens, greenhouses, and outdoor classrooms are cared for in conjunction with school campuses	**DCPS Ops** **Charter LEAs** DOEE WPD OSSE H&W
	c. Develop online learning modules for waste management, IPM, green cleaning, and green purchasing for building operations staff	**DGS** DCPS Ops
SC3. Develop communication tools to create and leverage partnerships between schools and environmental providers	a. Provide schools with a comprehensive list of outdoor opportunities on school grounds and throughout the District to be updated every 3 years	**OSSE H&W** DOEE WPD
	b. Create a resource hub that demonstrates how green building elements (green infrastructure) on school grounds can effectively be integrated into curriculum	**OSSE H&W** DGS DCPS Ops DOEE USA

COMMUNITY STAKEHOLDERS

BACKGROUND AND RATIONALE

Since 2014, 46 states plus the District of Columbia were in the process of developing, adopting, or implementing state environmental literacy plans; in 2019, the number of states implementing their plan increased from 13 to 20 (Bodor et al., 2020). The District adopted its state environmental literacy plan in July 2014.

Because these plans are still very new, research about them is only beginning to show up in the published literature. So far, these studies are dissertations and theses. For example, Ruggiero (2016) evaluated state environmental literacy plans against the NAAEE guidelines, and Duncan (2016) evaluated a tool for assessing middle school environmental literacy linked to Oregon's plan. Ruggiero (2016) states that the District's state environmental literacy plan is a strong example of a well-written collaborative plan with strength in curriculum, professional development, and assessment, as well as strong plans for graduation requirements and implementation.

According to information gathered by NAAEE, since beginning the process of developing their environmental literacy plans, many states report an increase in collaboration between state education agencies, local education agencies, natural resource agencies, university researchers, and environmental educators. Environmental educators from many states also report an increase in verbal and in-kind support from state departments of education and other local and state agencies. However, many of these plans were developed in anticipation of federal funding, so funding remains a major constraint for implementation in nearly all states (Bodor et al., 2020).

The US Department of Education's Green Ribbon Schools recognition program has identified and promoted environmental literacy as one of its three core pillars for demonstrating achievement. This designation has not only increased environmental literacy actions in thousands of schools nationwide, but it has resulted in unprecedented collaboration among state and local health, education, and environmental agencies. Additionally, national initiatives and resources, such as Rethink Outside or the Youth Outdoor Policy Playbook, leverage the connections and partnerships between education agencies, policymakers, and community interests and needs. Environmental literacy planning efforts can be both the foundation that supports learning about the world and also the umbrella under which educational activities might fall.

LOCAL CONTEXT

Since beginning to draft the first DC Environmental Literacy Plan in 2011, there has been a concerted effort to collaborate with local, regional, and national initiatives to drive the District's Environmental Literacy Plan implementation strategy. The 2020 DC Environmental Literacy Plan acknowledges changes that have occurred in the educational landscape, such as new early education standards, initiatives to ensure healthy learning environments, the need for the creation of online learning content, and improved tactics to share resources. OSSE will continue to coordinate plan implementation on the updated objectives, strategies, and action items. The updated plan builds upon progress that has been made in the eight years since the first plan was written and continues to encourage collaboration across agencies to promote quality environmental education programs for students.

Updated in 2019, Sustainable DC 2.0 now includes Education as a stand-alone topic area for implementation, and it continues to recognize that the ELP is the appropriate platform on which to build environmental and sustainability education into District schools (DOEE, 2019). In the Sustainable DC 2.0 Plan, implementation of the ELP is a specific action item to achieve Education Goal 1: Ensure every student in the District graduates with the knowledge to protect and restore their local environment. The goal includes the following:

- Target: By 2032, teach 100 percent of children in the District about environmental and sustainability concepts; and
- Action 1.3: Launch the implementation of the Environmental Literacy Plan.

The 2014 Chesapeake Bay Watershed Agreement marks the first time the regional commitment includes an environmental literacy goal. Action items within the DC Environmental Literacy Plan have been integrated in the District's Chesapeake Bay Watershed management strategies and work plans so that both initiatives move forward in tandem (CBP, 2018).

Every year, District representatives attend or present at the NAAEE annual conference. The District's early implementation efforts have informed efforts across the country, notably in Colorado and Oregon. The District also is examining best practices from other states, such as the Environmental Literacy Model used in Maryland and the Rhode Island K-12 Environmental Literacy Assessment Plan, to develop the District's next phase of implementation.

The Environmental Literacy Plan serves as a vehicle to navigate through local priorities, regional commitments, and national efforts. By viewing these initiatives through the lens of environmental literacy, many stakeholders have collaborated to foster environmental literacy integration in District schools. Below are descriptions of District agency commitments:

- **Department of Energy and Environment (DOEE)**
  DOEE's Watershed Protection and Fisheries and Wildlife divisions provide environmental education programs for students and educator trainings. The Energy Administration hosts an annual Electric Vehicle Grand Prix, a hand-on educational opportunity for high school students. The Urban Sustainability Administration monitors progress on Sustainable DC 2.0, which includes implementation of the ELP as a core action to reach the Education goal and targets. Many divisions also support activities for the summer youth Green Zone Environmental Program.

- **District of Columbia Public Schools (DCPS)**
  As DCPS moves into its next phase of strategic planning for science education over the next three years, the focus will be on access and equity for elementary grades, to ensure that all students have explicit opportunities to engage in Next Generation Science Standards (NGSS) aligned learning experiences. For secondary grades, the focus will be on student outcomes and achievement in order to ensure that all students are reaching their full potential and are meeting the expectations of the learning standards outlined in the NGSS. Environmental literacy has a strong connection to these science instruction outcome areas, as NGSS emphasizes investigating natural phenomena and exploring real world contexts for learning about science.

- **University of the District of Columbia (UDC)**
  UDC's Equity Imperative is the strategic plan designed to regenerate the university as a public higher education model of urban student success. The 2022 plan includes goals to work more closely with public and public charter schools, with an initiative to provide STEM teacher training for schools in wards 7 and 8.

- **Department of Parks and Recreation (DPR)**
  In early 2020, DPR launched the development of Ready 2 Play: The 20-year DPR Master Plan. The prior strategic plan included "be green" principles to promote practices that connect residents to their local environment, which are still part of the agency's mission and vision.

STATUS

The development and formal adoption of the DC Environmental Literacy Plan has helped improve cross-agency communication and collaboration, centralize implementation with OSSE, and solidify funding for programs. As a result, the District has emerged as a national leader in environmental literacy plan implementation.

By strategically embracing and collaborating with other District initiatives and priorities, the District's investment in environmental literacy programs has grown significantly since the ELP was submitted to DC Council in 2012. With funding primarily from the US Environmental Protection Agency's Chesapeake Bay Implementation Grant and Clean Water State Revolving Fund, the US Fish and Wildlife Services' Aquatic Resources Education grant, as well as the Anacostia Clean Up and Protection Fund and the District Stormwater Enterprise Fund, DOEE manages several environmental education grant programs. In 2014, DOEE awarded its largest, multi-year environmental education grant: $1.2 million toward overnight meaningful watershed educational experiences for District fifth graders. In 2019, the agency re-committed that level of funding to maintain the program through the 2020-21 school year. DOEE also continues to fund trash reduction programs in schools as part of the Trash Free Communities grant, professional development for teachers at schools participating in the RiverSmart Schools program and the Project WILD suite of training workshops. Additionally, DOEE administers a grant of more than $315,000 to fund educational trips for the general public on the Anacostia River.

OSSE's current programs include an Environmental Literacy Leadership Cadre for elementary school teachers, the Environmental Literacy Advancement Grant to support environmental literacy efforts at cadre schools, and the Climate Change Films project. These programs are in addition to other grants funded by the Healthy Schools Act to support school gardens and farm field trips. In June 2019, the Chesapeake Bay Education Workgroup convened a Leadership Summit on Environmental Literacy for high-level leadership from state departments of education and state natural

resource agencies to communicate how the Chesapeake Bay Watershed Agreement can be a driver to ensure diversity, equity, inclusion, and justice in environmental education (CBP, 2019). Additionally, the Superintendents' Environmental Education Collaborative appears to be a promising model to share information regarding ESSA grant opportunities, best practices for creating environmental education models, and promoting successful implementation stories (SEEC, 2020).

Within OSSE, the environmental literacy program is housed in the Division of Health and Wellness (H&W), which is beginning to organize its programs through the lens of the Centers for Disease Control and Prevention's (CDC) Whole School, Whole Community, Whole Child Model (CDC, 2019) (see Figure 3 below).

Figure 3. Whole School, Whole Community, Whole Child Model

The Whole School, Whole Community, Whole Child (WSCC) model is an expansion and update of CDC's Coordinated School Health approach. By focusing on youth, addressing critical education and health outcomes, organizing collaborative actions and initiatives that support students, and strongly engaging community resources, the WSCC approach offers important opportunities that may improve healthy development and educational attainment for students. The physical environment component stipulates that a healthy and safe physical school environment promotes learning by ensuring the health and safety of students and staff. The environment includes the physical school building, the land on which the school is located, and the area surrounding it, and also health aspects related to the school's physical condition (e.g., ventilation, natural lighting), protection from physical threats (e.g., crime, traffic, injuries), and biological and chemical agents (e.g., pollution, mold, pesticides, and cleaning products).

Recent initiatives have also spurred cross-agency collaboration. Capital LEAF (Leaders in Environmental Actions for our Future) is a new recognition program for green, healthy, and sustainable schools. OSSE, DGS, DOEE, DCPS, and community partners are currently developing a tiered system of engagement to bring schools closer to becoming eligible for the US Green Ribbon Schools recognition program. OSSE intends to launch the program during the 2020-21 school year.

In 2019, a District team comprised of DOEE, DPR, and DCPS applied and was selected to become part of the third cohort of the Cities Connecting Children to Nature (CCCN) initiative, a project of the National League of Cities and the Children & Nature Network. The District team joined cities from around the country for a three-day leadership academy to share best practices and develop strategies to engage youth in the outdoors. As a member of the network, the District regularly interacts with other cities as well as nonprofit environmental education organizations who can provide technical assistance. As a result of the academy, DOEE co-hosted a Green Jobs Summit in fall 2019 to hear from

workforce development trainers, participants and employers and identify strategies to advance career pipelines in the green economy.

In 2020, DCPS, DOEE, and the University of the District of Columbia (UDC) signed a Memorandum of Agreement to serve as anchor partners in the Anacostia High School Redesign. DOEE and UDC are now working with DCPS to provide educational programming, teacher professional development, student mentorship, and other resources to support environmental, civil engineering, public leadership, and social justice-focused goals. DOEE has also awarded Community Stormwater Solutions grants to engage local environmental education nonprofit partners in project-based learning and sustainability efforts at Anacostia High School.

DOEE supported DPR's virtual "Camp at Home" during the COVID-19 public health emergency by creating videos that introduce youth to the wildlife in the District's Aquatic Resources Education Center and visit neighborhood rain gardens.

In 2016, the District's Office of Planning began drafting amendments to the District of Columbia's Comprehensive Plan, a 20-year framework that guides future growth and development in the District. Originally adopted in 2006 and amended in 2011, it addresses a wide range of topics that affect how we experience the city. These topics include land use, economic development, housing, environmental protection, historic preservation, transportation, and more. The Comprehensive Plan Amendment Act of 2020 was introduced to DC Council in April 2020 and public hearings are scheduled for November 2020 (DC Council, 2020). The updated draft has an element section titled Environment, Education, and the Economy, which includes the subsection of Sustainability Education and Stewardship. In this section, the DC Environmental Literacy Plan is highlighted as one of the road maps for environmental education implementation. The draft retains a policy focus on sustainability education in District schools and actions related to clean water and anti-litter education, and proposes an action concerning sustainable schools and schoolyard greening efforts.

On the horizon are opportunities to explore alignment with environmental literacy plan implementation. OSSE's Health and Wellness Division has adopted the multi-tier system of supports (MTSS) framework to provide resources and technical assistance to schools. The division plans to examine opportunities to align and strengthen efforts around professional development, funding, and curricular resources for teachers, principals, and District LEA leadership. Higher education institutions and museums are also potential partnership opportunities. Additionally, in response to the COVID-19 public health emergency, outdoor learning has emerged as a strategy for reopening schools (GSA, 2020). While outdoor learning on its own does not necessarily translate into an environmental education program, it may provide leverage to create outdoor classrooms and spaces that lend themselves to hands-on activities and investigations. In the interim, environmental partners can continue to provide resources for distance learning and opportunities for students and their families to mentally recharge and connect with the outdoors.

By formalizing a commitment for ensuring that District students have access to academic courses, outdoor field experiences, and volunteer opportunities that reflect the diversity of prospective careers within the environmental field, the vision of well-informed District students graduating high school who are prepared to be competitive in the green economy can be realized.

Community Stakeholders Objective

All community stakeholders collaborate across sectors to provide opportunities to teachers, students, and school-based initiatives that support the environmental literacy goal.

Table 7. Community Stakeholder Strategies and Action Items

Strategy	Action Item	**Lead** Partner
CS1. Cultivate and foster the knowledge and awareness necessary for the development and implementation of ELP at Local Education Agencies (LEAs)	a. Create systems of support for principal and District LEA leadership to build awareness, engagement, and participation around environmental literacy	**OSSE H&W** DCPS
CS2. Create state infrastructure for implementation of the ELP	a. Regularly convene the Environmental Literacy Advisory Committee to review progress and provide implementation recommendations	**OSSE H&W**
	b. Designate staff within each agency to support ELP efforts and to provide OSSE with yearly updates on progress	**All agencies**
	c. Identify ongoing, committed funding to support MWEE	**DOEE WPD** **DOEE USA**
CS3. Utilize multiple communication platforms to highlight environmental efforts	a. Explore opportunities to publicly report school-level participation in environmental literacy initiatives	**OSSE H&W** DCPS Charter LEAs
	b. Promote the use of existing resources and websites by adding website content at least twice per year	**All agencies**

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APPENDIX A.

WORKGROUP

Under the DC Healthy Schools Act of 2010, the Office of the State Superintendent of Education (OSSE) is designated as the lead agency to triennially develop an environmental literacy plan, in conjunction with the following agencies:

- Department of Energy and Environment;
- District of Columbia Public Schools;
- District of Columbia Public Charter School Board;
- Office of the State Superintendent of Education;
- District of Columbia State Board of Education;
- University of the District of Columbia;
- Department of Parks and Recreation;
- Department of General Services; and
- Department of Employment Services.

Workgroup Members

In February 2020, OSSE hosted a kickoff meeting to begin the process of updating the DC Environmental Literacy Plan. At this meeting, the DC Environmental Literacy Plan Workgroup was formally re-instated, comprised of representatives designated by each required District agency. Below are workgroup members.

- Department of Energy and Environment
  - Patricia (Trinh) Doan
  - Caroline Howe
  - Kara Pennino
  - Teresa Rodriguez

- District of Columbia Public Schools
  - Sally Parker*
  - James Rountree
  - Joi Ruffin
  - Brandon Showell

- District of Columbia Public Charter School Board
  - Audrey Williams

- Office of the State Superintendent of Education
    - Daniel Alcazar-Roman
    - Lauren Allen
    - Tia Brumsted
    - David Esquith
    - Grace Manubay (project coordinator)
    - Candice Mott
    - Charles Rominiyi
    - Sam Ullery

- District of Columbia State Board of Education
    - Emily Gasoi

- University of the District of Columbia
    - Yahya (Mustafaa) Madyun
    - Kamran Zendehdel

- Department of Parks and Recreation
    - Erica Carlsson*

- Department of General Services
    - Brooke Hartman

- Department of Employment Services
    - Thennie Freeman

* Denotes participants who no longer work at the listed agency

APPENDIX B.

GLOSSARY OF TERMS

ACRONYMS

CTE: Career Technical Education
DCEEC: District of Columbia Environmental Education Consortium
DCPS: District of Columbia Public Schools
DGS: Department of General Services
DOEE: Department of Energy and Environment
DOES: Department of Employment Services
DPR: Department of Parks and Recreation
ELP: Environmental Literacy Plan
HSA: Healthy Schools Act
LEA: Local Education Agency
LEED: Leadership in Energy and Environmental Design
LID: Low Impact Development
MWEE: Meaningful Watershed Educational Experience
NAAEE: North American Association for Environmental Education
NGSS: Next Generation Science Standards
OSSE: Office of the State Superintendent of Education
PARCC: Partnership for Assessment of Readiness for College and Careers
PCSB: Public Charter School Board
SBOE: State Board of Education
SEER: State Education and Environment Roundtable
SHP: School Health Profile
STEM: Science, Technology, Engineering, and Math
UDC: University of the District of Columbia
WSCC: Whole School, Whole Community Whole Child Model

DC Environmental Education Consortium (DCEEC): A network of environmental and conservation educators that works to increase capacity to provide meaningful environmental education for the residents of the District of Columbia. Members provide environmental expertise, professional development opportunities, curricula and resources, and hands-on classroom and field experiences to District schools. (dceec.org)

District of Columbia Public Charter School Board (PCSB): Organization established to ensure students and families in Washington, DC, have access to quality public charter school education through setting tough academic standards, using a comprehensive application review process and effective oversight, providing meaningful support, and actively involving parents, school leaders, the community, and policymakers. (dcpcsb.org)

Department of Employment Services (DOES): District government agency that provides comprehensive employment services to ensure a competitive workforce, full employment, life-long learning, economic stability, and the highest quality of life for all District residents. (does.dc.gov)

Department of Energy and Environment (DOEE): District government agency that improves the quality of life for the residents and natural inhabitants of the nation's capital by protecting and restoring the environment, conserving our natural resources, mitigating pollution, increasing access to clean and renewable energy, and educating the public on ways to secure a sustainable future. (doee.dc.gov)

Department of General Services (DGS): District government agency that elevates the quality of life for the District through construction, maintenance, and real estate management. DGS is responsible for building and maintaining safe and green state-of-the-art public facilities, such as all DCPS buildings. (dgs.dc.gov)

Department of Parks and Recreation (DPR): District government agency that promotes health and wellness, conserves the natural environment, and provides universal access to parks and recreation services. (dpr.dc.gov)

District of Columbia Public Schools (DCPS): The District's largest local education agency, the reference of which does not include public charter schools. (dcps.dc.gov)

Environmental Literacy: The development of knowledge, attitudes, and skills necessary to make informed decisions concerning the relationships among natural and urban systems.

Healthy Schools Act: Landmark law designed to improve the health and wellness of students attending public and public charter schools in the District. The act took effect August 2010 and includes a provision that requires the development of an environmental literacy plan.

Inquiry-Based Learning: Inquiry is a multifaceted activity that involves making observations; posing questions; examining books and other sources of information to see what is already known; planning investigations; reviewing what is already known in light of experimental evidence; using tools to gather, analyze, and interpret data; proposing answers, explanations, and predictions; and communicating the results. Inquiry requires identification of assumptions, use of critical and logical thinking, and consideration of alternative explanations. (National Science Education Standards, pg. 23)

Leadership in Energy and Environmental Design (LEED): Suite of rating systems for the design, construction and operation of high-performance green buildings, homes and neighborhoods. (usgbc.org/leed)

Meaningful Watershed Educational Experience: Approach to seamlessly connect standards-based classroom learning with outdoor field investigations to create a deeper understanding of the natural environment. Students explore local environmental issues through sustained, teacher-supported programming that includes, but is not limited to, issue

definition, outdoor field experiences, action projects, and sharing student-developed syntheses and conclusions with the school and community.

Office of the State Superintendent of Education (OSSE): The state education agency for the District of Columbia. OSSE's mission is to remove barriers and create pathways for District residents to receive a great education and prepare them for success in college, careers, and life. (osse.dc.gov)

Partnership for Assessment of Readiness for College and Careers (PARCC): Consortium of states working together to develop a common set of K-12 assessments in English and math anchored in what it takes to be ready for college and careers. DC began administering the PARCC assessments during the 2014-15 school year.

Service-Learning: A teaching strategy that connects community service to the academic objectives in a way that students feel greater meaning and relevance to what they learn and in a way that develops strong citizenship skills. The National Youth Leadership Council identified eight components of high-quality service-learning: (1) youth voice, (2) meaningful, (3) link to curriculum, (4) diversity, (5) progress monitoring, (6) reflection, (7) duration and intensity, and (8) partnerships.

State Board of Education (SBOE): Board established on June 12, 2007, as part of the District of Columbia Public Education Reform Amendment Act of 2007. Responsible for advising the State Superintendent of Education on educational matters, including: state standards; state policies, including those governing special, academic, vocational, charter and other schools; state objectives; and state regulations proposed by the mayor or the State Superintendent of Education. (sboe.dc.gov)

Sustainability: Nexus of the environmental health, economic prosperity, and social vitality. Sustainability meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable DC (SDC): A government plan launched in 2011 to address goals and the interconnections between the built environment, climate, energy, food, nature, transportation, waste, water, and the green economy. The Sustainable DC 2.0 Plan was updated in 2019, adding Education and Economy to the list of sections for which Sustainable DC sets goals, targets, and actions. The remaining sections are Governance, Equity, Built Environment, Climate, Energy, Food, Health, Nature, Transportation, Waste, and Water. (sustainable.dc.gov)

University of the District of Columbia (UDC): Chartered in 1974, UDC is a pacesetter in urban education that offers affordable and effective undergraduate, graduate, professional, and workplace learning opportunities. As a public, historically black, and land-grant institution, the university's responsibility is to build a diverse generation of competitive, civically engaged scholars and leaders. (udc.edu)

APPENDIX C.

ENVIRONMENTAL LITERACY ORGANIZATIONS WITH RESOURCES FOR SCHOOLS

To compile these resource lists, OSSE created an online survey for organizations to complete. Responses were collected from April – June 2020, and all the data in these tables are self-reported.

AIR – INCLUDES AIR QUALITY, CLIMATE CHANGE

Organization	Curricular Resources	School-based Presentations	Field Experiences	Professional Development	Funding	Community Service
Anacostia Aquaponics		X	X	X		
Casey Trees	X	X				
Chesapeake Bay Foundation	X		X	X		
Clean Air Partners	X	X		X		
Dance Exchange	X	X	X	X		
Earth Day Network	X					
Earth Force				X		
EcoRise Youth Innovations	X			X	X	
FreshFarm Markets	X					
Friends of the National Zoo				X		
Kaleidoscope	X	X		X		
Living Classrooms of the National Capital Region			X	X		
National Children's Museum	X			X		
National Energy Education Development Project	X			X		
National Geographic Society	X			X	X	
National Park Service – Rock Creek Park		X	X			
Office of the State Superintendent of Education	X				X	
US Environmental Protection Agency	X	X		X	X	
Urban Adventure Squad			X			X

WATER – INCLUDES STORMWATER, RIVERS, AND AQUATIC WILDLIFE

Organization	Curricular Resources	School-based Presentations	Field Experiences	Professional Development	Funding	Community Service
Alice Ferguson Foundation	X		X	X		
Anacostia Aquaponics		X	X	X		
Anacostia Watershed Society	X	X	X	X		X
Association of Fish and Wildlife Agencies	X			X		
Casey Trees	X	X	X			X
Chesapeake Bay Foundation	X		X	X		
Dance Exchange	X	X	X	X		
DC Water	X	X				X
Department of Energy and Environment	X	X	X	X	X	X
Earth Day Network	X					
Earth Force		X		X	X	
EcoRise Youth Innovations	X			X	X	
FreshFarm Markets	X	X				
Friends of the National Arboretum		X	X			
Friends of the National Zoo	X		X	X		X
Kaleidoscope	X	X		X		
Live It Learn It		X	X			
Living Classrooms of the National Capital Region	X	X	X			X
National Children's Museum	X			X		
National Geographic Society	X			X	X	
National Mall and Memorial Parks			X	X		X
National Museum of the American Indian	X			X		
National Park Service – Rock Creek Park	X	X	X	X		X
NatureBridge			X		X	
Office of the State Superintendent of Education	X			X	X	
US Botanic Garden	X		X	X		X
US Environmental Protection Agency	X	X		X	X	
Urban Adventure Squad	X	X	X			X
Urban Forestry Division – District Department of Transportation			X			
Wilderness Leadership and Learning, Inc.			X			X

LAND – INCLUDES PLANTS, SOIL, URBAN PLANNING, AND TERRESTRIAL WILDLIFE

Organization	Curricular Resources	School-based Presentations	Field Experiences	Professional Development	Funding	Community Service
Alice Ferguson Foundation	X		X	X		
Anacostia Aquaponics		X	X	X		
Association of Fish and Wildlife Agencies	X			X		
Casey Trees	X	X	X			X
Chesapeake Bay Foundation	X		X	X		
City Blossoms	X	X	X	X		X
Common Good City Farm	X		X			X
Dance Exchange	X	X	X	X		
Earth Day Network	X					
Earth Force				X		
EcoRise Youth Innovations	X			X	X	
FreshFarm Markets	X	X		X		X
Friends of the National Arboretum		X	X	X		
Friends of the National Zoo	X		X	X		X
Kaleidoscope	X	X		X		
Live It Learn It		X	X	X		
Living Classrooms of the National Capital Region	X		X	X		X
National Children's Museum	X			X		
National Geographic Society	X			X	X	
National Mall and Memorial Parks		X				X
National Museum of the American Indian	X			X		
National Park Service – Rock Creek Park	X	X	X	X		X
NatureBridge			X		X	
Office of the State Superintendent of Education	X			X	X	
US Botanic Garden			X	X		X
US Environmental Protection Agency	X	X		X	X	
Urban Adventure Squad			X			X
Urban Forestry Division – District Department of Transportation	X	X	X	X		X
Wilderness Leadership and Learning, Inc.			X			X

RESOURCE CONSERVATION – INCLUDES ENERGY, WASTE, AND RECYCLING

Organization	Curricular Resources	School-based Presentations	Field Experiences	Professional Development	Funding	Community Service
Alice Ferguson Foundation	X	X	X	X		X
Anacostia Aquaponics		X	X	X		
Association of Fish and Wildlife Agencies	X					
Chesapeake Bay Foundation				X		
City Blossoms	X		X	X		X
Common Good City Farm	X		X			X
Dance Exchange	X		X	X		
DC Department of General Services	X	X				X
DC Water		X				
Department of Public Works	X	X				X
Earth Day Network	X					
Earth Force		X		X	X	
EcoRise Youth Innovations	X			X	X	
FreshFarm Markets	X	X				
Friends of the National Arboretum		X	X	X		
Friends of the National Zoo	X		X	X		X
Kaleidoscope	X	X		X		
Live It Learn It		X	X			
Living Classrooms of the National Capital Region	X		X			X
National Children's Museum	X			X		
National Energy Education Development Project	X			X	X	X
National Geographic Society				X	X	
National Mall and Memorial Parks		X	X	X	X	X
National Museum of the Amer Indian	X					
National Park Service – Rock Creek Park	X	X	X	X		X
NatureBridge			X		X	
Office of the State Superintendent of Education	X			X	X	
US Botanic Garden	X		X	X		X
US Environmental Protection Agency	X	X		X	X	
Urban Adventure Squad	X		X			X
Wilderness Leadership and Learning, Inc.			X			X

HEALTH – INCLUDES OUTDOOR PHYSICAL ACTIVITY, GARDENS, AND FOOD

Organization	Curricular Resources	School-based Presentations	Field Experiences	Professional Development	Funding	Community Service
Alice Ferguson Foundation			X			
Anacostia Aquaponics		X	X	X		
City Blossoms	X	X	X	X		X
Clean Air Partners	X	X				
Common Good City Farm	X		X			X
Dance Exchange	X	X	X	X		
Department of Energy and Environment					X	
Earth Force				X		
EcoRise Youth Innovations	X			X	X	
FreshFarm Markets	X	X		X		
Friends of the National Arboretum		X	X	X		X
Friends of the National Zoo	X					X
Live It Learn It		X	X			
National Children's Museum	X			X		
National Museum of the American Indian				X		
National Park Service – Rock Creek Park		X	X			
NatureBridge			X		X	
Office of the State Superintendent of Education	X			X	X	
Park Rx America	X	X		X		
US Botanic Garden			X	X		X
US Environmental Protection Agency	X	X		X	X	
Urban Adventure Squad	X		X			X
Urban Forestry Administration – District Department of Transportation	X	X				
Wilderness Leadership and Learning, Inc.			X			

APPENDIX D.

ENVIRONMENTAL LITERACY FRAMEWORK

for the District of Columbia

Environmental literacy is the development of knowledge, attitudes, and skills necessary to make informed decisions concerning the relationships between natural and urban systems

An environmentally literate* person:

- can discuss and describe ecological and environmental systems and human impacts on these systems;
- engages in hands-on, outdoor learning experiences that involve discovery, inquiry, and problem solving;
- is able to question and analyze information pertaining to his or her surrounding environment; and
- has the capacity to take actions that respect, restore, protect, and sustain the health and well-being of human communities and environmental systems.

*as defined in the DC Environmental Literacy Plan adopted 2014

The Environmental Literacy Framework is a guide for schools that identifies the knowledge and skills District students need to become environmentally literate. The framework is outlined by **grade level** (Pre-K–Grade 8) or **science subject area** (high school) and aligned with the **Next Generation Science Standards (NGSS) Performance Expectations**. Included are **environmental contexts for learning** and **guiding questions** designed to scaffold content appropriate to each grade level. Based on themes taken from the Sustainable DC Plan, **sustainability initiatives** provide starting points for in-depth investigations and suggestions for extending learning beyond the classroom.

Grade Level	NGSS Performance Expectations	Environmental Contexts for Learning: Guiding Questions	Sustainability Initiatives
Pre-K	See the District of Columbia's Early Learning Standard 5.0: Scientific Inquiry*	**The World Around Us:** How can we use our five senses to learn about the environment?	**Nature:** Extend your classroom into the schoolyard.
K	K-PS3-1, K-PS3-2. K-LS1-1. K-ESS2-2, K-ESS3-1, K-ESS2-1, K-ESS3-2.	**Living Things:** What do plants and animals need to survive?	**Nature/Food:** Visit an urban garden or farm.
1	K-2-ETS-1-1. 1-LS1-2, 1-LS3-1. 1-ESS1-1, 1-ESS1-2.	**Patterns and Growth:** How do natural patterns affect living things? How do plants and animals change over the course of their lives?	**Nature:** Visit a zoo/aquarium.
2	2-PS2-1, 2-PS2-2. 2-LS2-1, 2-LS2-2, 2-LS4-1. 2-ESS2-1, 2-ESS2-2, 2-ESS2-3.	**Changing Landscapes:** How do plants and animals support each other in our community? What forces change our local landscape?	**Water:** Explore a local waterway. **Built Environment:** Survey your neighborhood.
3	3-LS2-1, 3-LS3-2. 3-LS-4. 3-ESS2-1, 3-ESS2-2, 3-ESS3-1.	**Environmental Changes and Adaptations:** How have local changes in climate affected the environment? How do living things adapt to changes in the environment?	**Nature:** Travel to a rural farm. **Waste**: Tour a recycling center or landfill.
4	4-PS3-2, 4-PS3-4. 4-ESS3-1, 4-ESS3-2. 4-LS1-1, 4-LS1-2. 4-ESS1-1, 4-ESS2-1.	**Earth's Resources:** How do humans use natural resources? What processes influence the Earth's physical features?	**Waste:** Conduct a cafeteria waste audit. **Transportation:** Organize a walk/bike to school day.
5	5-PS3-1. 5-LS1-1, 5-LS2-1. 5-ESS2-1.	**Web of Life:** We are what we eat; how does energy cycle through the food web? How do the four spheres of the Earth's systems interact?	**Food/Water/Nature:** Engage in an overnight Meaningful Watershed Educational Experience.

*NGSS does not include standards for Pre-K.

Grade Level	NGSS Performance Expectations	Environmental Contexts for Learning: Guiding Questions	Sustainability Initiatives
6	MS-ESS3-1, MS-ESS3-2, MS-ESS3-3, MS-ESS3-4, MS- ESS3-5.	**Earth and Human Activity:** What are the consequences of human activity on air, land, and water over time?	**Built Environment:** Tour a green infrastructure site.
7	MS-LS2-1, MS-LS2-2, MS-LS2-3, MS-LS2-4, MS-LS2-5.	**Exploring Solutions:** How can we creatively address the environmental consequences of human activity?	**Nature/Water:** Improve local watershed health by reducing stormwater runoff at your school. **Food**: Define healthy-healthy eating and design a personal healthy-eating goal.
8	M5-PS3-1, M5-PS3-2, M5-PS3-3, M5-PS3-4, M5-PS3-5.	**Earth Works:** How do the choices you make affect the environment?	**Waste:** Analyze your carbon footprint and create a personal action plan to reduce it. **Energy:** Conduct a school-wide energy audit.

High School Subject Area	NGSS Performance Expectations	Environmental Contexts for Learning: Guiding Questions	Sustainability Initiatives
Earth Science	HS-ESS2-2, HS-ESS2-4. HS-ETS1-1. HS-ESS3-1, HS-ESS3-5. HS-ETS1-1.	**Our Changing Planet**: How do changes in climate occur, and how do they impact Earth's systems and human activity?	**Waste/Transportation:** Research the ways current transportation and waste systems impact climate.
Biology	HS-LS1-5, HS-LS1-6, HS-LS1-7. HS-LS2-1, HS-LS2-2, HS-LS2-7. HS-ETS1-2.	**Designing and Evaluating Solutions**: What are the ecological impacts of our food choices? How can humans reduce their environmental footprint?	**Food:** Design and evaluate a nutrition plan for a healthy adult that supports a sustainable local food system. **Nature:** Conduct a biodiversity transect.
Chemistry	HS-PS1-2, HS-PS1-3, HS-PS1-6. HS-ESS2-2, HS-ESS2-5, HS-ESS2-6. HS-ETS1-3.	**Collect and Analyze Data:** What evaluation can be made about the health of the District and it's residents based on a cross-section of data?	**Nature/Water:** Conduct water-, soil-, and air-quality tests in the District and analyze the results.
Physics	HS-PS3-3, HS-PS3-4. HS-ETS1-4.	**Alternative Energy:** What innovations will help meet future energy needs?	**Energy/Built Environment:** Compare the efficiency of existing power systems and design a carbon-neutral energy generation system.

District of Columbia
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