BALTIMORE CITY
PUBLIC SCHOOLS

Environmental Literacy Program

January 2020

City Schools' seeks to develop the knowledge, attitudes, and skills necessary for students 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.

Promoting environmental literacy is one of City Schools' goals outlined in its Sustainability Plan. To implement the plan, City Schools is:

- Providing teacher professional development led by peers and partners
- Offering students field experiences at Baltimore-area partner locations
- Providing resources to teachers and staff to learn about and implement green practices
- Promoting the Maryland Green Schools program
- Supporting staff to be Sustainability Ambassadors at their schools
- Providing Achievement Units to teachers who take on additional green, environmental, and sustainability roles

Environmental Literacy Grade-Level Overview – PreK-5

Traditional schools follow the SABES* curriculum

* STEM Achievement at Baltimore Elementary Schools

Grade	Content Area	Description	Possible Partner(s)
PK		Unit "On the move" – use recycled materials to create a vehicle. (per Hampden EMS) "For the March project, your child will create a	

		mode of transportation using recycled materials (toilet paper rolls, milk cartons, egg cartons, boxes, tissue boxes, lids, etc.). She/she will write about the vehicle created. In the writing, make sure to include what kind of vehicle it is, if it is land, water, or air transportation, and what it is made out of. Be creative!	
K	Science	<u>Unit 3 – Plants & animals; what do plants and animals need to survive?</u> ● Lessons 4-24 – Needs and habitats of plants; nature walk; Chesapeake Bay ecosystem; design challenge is to build a Lifepod, a habitat for a specific animal.	
1	Science	<u>Unit 3 – Wonders of Life</u> ● Lessons 1-15 – Classifying different organisms such as birds, mammals and reptiles by identifying and describing their characteristics; plants in the schoolyard; how do plants survive in different environments; design challenge is a seed dispersal.	● Urban Bird Sound Projects ● Patterson Park Audubon
1	Science	<u>Unit 4 – Calls of the wild</u> ● Lessons 8-10 – Animal sounds and communication; design challenge is making an animal from recycled materials that makes sounds.	● Urban Bird Sound Projects ● Patterson Park Audubon
2	Science	<u>Unit 3 - What do plants need?</u> ● Lessons 3-7 – Plants, plant structure, what seeds need to survive; germinating a seed. ● Lessons 8-11 – What is pollination? Why do we need bees? ● Lesson 12-14 – design challenge is to make a pollinator for a new plant species.	● Great Kids Farm/Food and Nutrition Services/Friends of Great Kids Farm – curriculum-embedded STEM Experience to the farm. ● Rawlings Conservatory – curriculum-embedded STEM experience to the conservatory for schools in zip code 21217

			● City Schools School Garden Toolkit
1	English Language Arts	Module 1 – World of Books Optional connection to a Little Library in the garden and a walk to the local Enoch Pratt Library branch. Module 2 – Creature Features – animal adaptations, Jane Goodall book, how do animals use same features in unique ways, what can we discover about animal features, list of books. Module 3 – Powerful forces. The power of the wind. How characters respond to the wind. What are feelings? Optional connection to go outside into the wind.	
2	English Language Arts	Module 1 – Season of Change. "How do you know its fall?" book. What changes in fall affect people and nature, e.g. leaves in fall? How does it affect the little yellow leaf? How does the chameleon change? How do monarch butterflies migrate? "Skytree" book. Images of a tree changing in the seasons. Module 4 – Good Eating. How can food nourish my body? How can food nourish a community? Link to a video about a community garden. What are nutrients in food? Where does nourishing food come from?	
3	Science/English Language Arts	ELA RI.3.1., Env Lit 6 (4) B1 – students will be able to ask and answer questions about how natural resources are used by explaining how to reduce consumption during the holidays. (Hampden EMS)	
3	Science	Unit 1 – Insect Encounter ● Lesson 6 – Butterfly life cycle. What is the pattern of life cycle states that butterflied go through? ● Lessons 10-13 – Insect survival, including living and nonliving things in our environment, local food webs, ants working together.	● Maryland Zoo – curriculum-embedded STEM experience

3	Science	<u>Unit 4 – Survival of the Fittest</u> ● Lessons 1-8 – Animals and habitats; classifying animals by biome; animal adaptations for survival. ● Lesson 10-11 – Who needs bees? How can people help solve problems in the environment? Solutions to the problem of declining bee population.	● Maryland Zoo – curriculum-embedded STEM experience ● Monarch initiative?
4	Social Studies	Every Kid in a Park (EKiP) - All 4th grade students visit Hampton National Historic Site, Fort McHenry National Historic site, or Gwynns Falls Leakin Park for a cultural or ecological experience and receive passes for their families for free entry to National and Maryland public lands for up to one year	● National Park Foundation ● National Park Service ● Baltimore City Recreation and Parks ● Baltimore National Heritage Area
5	Health	National Health Education Standards – 7.5.1 – Identify responsible personal health behaviors. Students will plant flowers in the school garden in order to identify benefits of gardening that effect personal mental and social behavior.	●
5	Science	<u>Unit 4- Conserving earth's resources</u> ● Lessons 1-5 – What are renewable and non-renewable resources? Why is it important to conserve non-renewable resources? ● Lessons 6-7 – How do humans impact the environment? ● Lessons 10-15 – How can wind be a source of energy? Design challenge is to build a windmill	●
5	Science	<u>Unit 5 - Save the Bay</u> ● Lessons 1-15 Meaningful Watershed Educational Experience (MWEE) – including study of the Chesapeake Bay; plants and animals in the bay; rain fall and ground cover; schoolyard assessment; action project.	● Chesapeake Bay Foundation – curriculum-embedded STEM experience ● Waterfront Partnership – curriculum-embedded STEM experience

			● Towson University – teacher professional development

Middle School – Grades 6-8

Traditional schools follow the IQWST* curriculum

* Investigating and Questioning our World through Science and Technology, with full implementation in SY2021

Grade	Content Area	Description	Possible Partner(s)
6	Science (IQWST)	Unit 3 – Where have all the creatures gone? ● Organisms' needs for survival; what happens when those needs are not met; how abiotic factors affect ecosystems	● National Aquarium in Baltimore – *What Lives in the Harbor* is the MWEE supported by the Chesapeake Bay Trust and NOAA B-WET
6	Science	Unit 4 – How does water shape our world? ● Extensions include: energy consumption, causes of deforestation, population growth, oil spills, beach clean up	
7	Health	Healthy vs Unhealthy Behaviors – National Health Education Standards. 2.8.3 Describe how peers influence healthy and unhealth behaviors. Students will identify at least three positive/negative actions that may impact plant life around our school in order to describe how peers influence health and unhealthy behaviors. (Hampden EMS)	
7	Science	Unit 2 – Why do some things stop while others keep going? ● Batteries, solar power ● Extensions include renewable and non-renewable energy.	
7	Science	Unit 3 - What makes the weather change?	

		● Extensions include: climate change, global warming, greenhouse gases	
7	Science	Ingenuity capstone challenge: Nitrogen reduction project For schools participating in the Ingenuity project, this capstone challenge is about the effect of excess nutrients in the Chesapeake Bay. Design challenge is to plan and create a prototype of a device that will reduce nitrogen in the water.	Ingenuity schools include Hamilton, James McHenry EMS, Mt. Royal, and Roland Park, but some schools with honor programs complete this capstone challenge
8	Science	STEM Cleans the Oceans Activity. Our 8th Grade students took part in a week-long project to design and create prototypes to clean the oceans. Students researched pollution in the ocean and then working with their table groups created a device that could be used to clean the oceans. Students then presented their ideas to the class through the form of a presentation, along with their created prototype. This project purpose was to make our students aware of the impact trash is having on the oceans ecosystem, along with challenging them to use engineering skills to create a solution to this problem. (Hampden EMS – Mr. Ives).	
8	Science (IQWST)	Unit 2 – Why do organisms look the way they do? ● Optional culminating project about the use of genetically modified organisms to solve problems, and the impacts these technologies have on society.	

High School

Grade	Content Area	Description	Possible Partner(s)
9	Science – Biology	Unit 3 – Energy and Ecosystems Lessons 1-18	

9	Science – Biology	<u>Unit 6 – Interdependent Relationships in Ecosystems</u> ● Lesson 1 – 20 – Meaningful Watershed Educational Experience (MWEE)	● Chesapeake Bay Trust ● Great Kids Farm – curriculum-embedded STEM experience ● Waterfront Partnership – curriculum-embedded STEM experience ● Baltimore City Recreation & Parks – curriculum-embedded STEM experience
9	Science – Biology	<u>Unit 7 – Environmental Sustainability</u> Students apply what they've learned about matter, energy, and interdependent biological relationships in ecosystems to the design of solutions to environmental problems caused by human impact. ● Lessons 1-20	
10	Science – Chemistry	<u>Unit 4 - Chemical Reactions: What is happening to our oceans?</u> ● Lesson 1 – Ocean acidification ● Lesson 4 – Buffers and the ocean ● Lesson 9-12 – Impact on the ocean ● Lesson 13 – Energy without carbon dioxide ● Lesson 24-25 – Designing a better battery <u>Unit 6 - Thermochemistry</u> ● Lesson 1 – Thermal exploration ● Lesson 15 - External energy source - energy from the sun ● Lesson 16 - Thermal radiation ● Lesson 17-18 - Baltimore's energy balance (urban heat island effect) <u>Unit 7 - Chemistry and Baltimore's Mountains</u> ● Lesson 12 - weathering and water quality	Baltimore Ecosystem Study

		● Lesson 13 - Salinity and streams (impact on non-porous surfaces on water quality)	
11	Science - Physics	<u>Unit 4- Climate Change</u> ● Lessons 1-23 – Human impact on the global climate by examining data sets of climate change indicators	
11 or 12	Science - Biology - AP	Students cultivate their understanding of biology through inquiry-based investigations as they explore the following topics: evolution, cellular processes, energy and communication, genetics, information transfer, ecology, and interactions. ● Unit 8 – Ecology – Responses to the environment, energy flow thru ecosystems, population ecology, community ecology, biodiversity, disruptions to ecosystems.	
11 or 12	Science - Environmental Science – AP	Course engages students with the scientific principles, concepts, and methodologies required to understand the interrelationships within the natural world, including identifying and analyzing natural and human-made environmental problems, evaluating the relative risks associated with these problems, and examining alternative solutions for resolving or preventing them. ● Unit 1: The Living World: Ecosystems ● Unit 2: The Living World: Biodiversity ● Unit 3: Populations ● Unit 4: Earth Systems and Resources ● Unit 5: Land and Water Use ● Unit 6: Energy Resources and Consumption ● Unit 7: Atmospheric Pollution ● Unit 8: Aquatic and Terrestrial Pollution ● Unit 9: Global Change	

Additional Activities

Title	Provider	Description

Green Leader Achievement Units (AUs)	Baltimore City Public Schools	Teachers of all subjects and grade levels can receive AUs for leading greening and sustainability activities at their school Teachers earn AUs as part of their contract for annual evaluations, college-level courses, and taking on additional school-based responsibilities.
Sustainability Ambassadors	Per City Schools' Sustainability Policy ADG, each school must designate a Sustainability Ambassador	The Ambassador is the point person on greening, sustainability, and environmental education at their school
Green, Healthy, Smart Challenge grants	Baltimore City Office of Sustainability; Baltimore Community Foundation	In 11th year of small grants ($1,000-$2,500) to schools for student-led greening activities, e.g. gardening, recycling, energy conservation
Green School Award	MD Association of Environmental and Outdoor Education (MAEOE)	30 schools currently have the award; City Schools and Baltimore City Office of Sustainability and local Green Centers assist schools to prepare strong applications

Partners

City Schools' central office and individual schools work with myriad partners to assist with professional development, in-school activities, and off-site trips, many of whom are listed in the Guide to Green Partners and Resources.

For more information, contact:
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