

MWEE Case Study: Student inquiry of plastic waste and its impacts on aquatic and marine ecosystems

Plum Point Middle School has 612 students enrolled in grades 6 through 8. Out of the entire student body, 27.3% of students are recognized as minorities with the largest population being African American and Mixed Race. This is considerably lower than the state average of 64% minority enrollment. The percentage of students that are proficient in English Language Arts and Math are 66% and 56.3%, respectively. The state average for middle schoolers reaching proficiency in English Language Arts is 44.5% and for Math is 23%. Maryland has an average student-teacher ratio of 15:1 compared to Plum Point Middle School at 16:1.

Calvert County Public Schools is in southern Maryland; roughly 30 miles southeast of Washington, DC. Calvert County has one of the smaller school systems in Maryland with 25 schools. With roughly 16,000 students in attendance in prekindergarten through 12th grade, 32% of whom classify as a minority. 14% of those students are Black, 7% Latino, and 10% identified as two or more races. Calvert County Public Schools also houses the CHESPAX environmental education program.

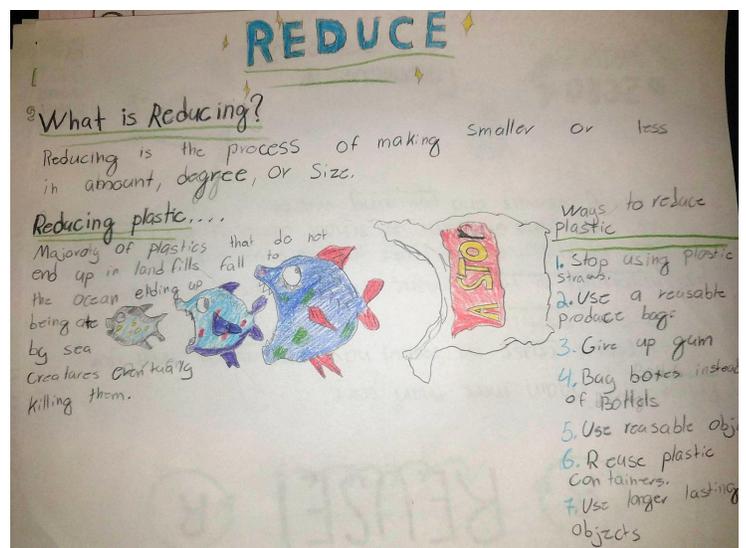
Calvert County Environmental Literacy Program

Students have several opportunities to interact with the Maryland E-Lit standards through the programs offered from CHESPAX. In elementary schools students complete hands-on activities, many of which have an outdoor field experience, learning about animals, fossils, pollinators, terrapins, and oysters. In secondary schools the E-Lit Standards are met in lessons about archeology, SAV monitoring, and plastic pollution.

Students Investigate, Analyze, and Take Action

The Wave of Plastic MWEE is a curricular unit helping middle school students make sense of the core ideas related to issues of plastic pollution (particularly those relevant to the Chesapeake Bay watershed) by engaging in authentic interdisciplinary practice culminating in comprehensive, student-driven, informed action projects.

At Plum Point Middle School, eighth grade students begin their MWEE by learning about the larger context of plastic pollution and its impact on nearby waterways and their local community. Students then identify a problem related to plastic pollution. Students also learn in the field as they notice what pollution they can find in their neighborhoods and as they investigate



how plastic pollution contributes to water pollution as runoff. Using these outdoor experiences along with the context provided, students can make conclusions regarding how plastic pollution is impacting their own communities. The final component of the MWEE is a service-learning project completed by each eighth grader. For some students this will take the form of spreading awareness amongst community members and peers. Other students will be more action oriented: organizing litter pick-ups or writing letters to local government officials.

MWEE Highlights and Lessons Learned

- Giving students the opportunity to select and investigate their own problems increases student engagement.
- Students benefit from seeing the relevancy of the problem. Plastic pollution is a problem that many face, however, highlighting how it affects local fishers and bayside businesses and communities helps to ground the lessons.
- When a solution is put in place, students feel a sense of accomplishment and pride which can encourage other students to complete their MWEE project.
- It is important to meet students where they are. Flexibility and revision is an integral part of guiding students to the completion of their projects.

Other Notes

- All 25 K-12 schools are recognized as Maryland Green Schools, achieving this certification for reducing environmental impacts, encourage sustainability, and encouraging environmental literacy.
- Eighth Graders complete a stream study focused on benthic macroinvertebrates as part of a lesson on using biodiversity to establish stream health. The results of which are shared with the Maryland Biodiversity Project.
- Seventh graders complete SAV monitoring while on a canoe trip in Cocktown Creek and the data that is collected is shared with USFWS after their trip.

Wave of Plastic represents a partnership between the University of Maryland Center for Environmental Science, Calvert County Public Schools, and St. Mary's County Public Schools. Funding support was provided by the NOAA Bay Watershed Education and Training (B-WET).