

Long Island Water Quality Design Challenge
A Professional Development Project
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Making decisions about the learning opportunities students encounter is an important process that can make all the difference in the educational experiences for our students. Creating authentic experiences that develop a growing sense of civic responsibility while also developing critical thinking, problem solving and iterative thinking skills are important goals for our students. The LI Water Quality Challenge was a perfect opportunity to facilitate this type of high quality, project-based learning that I am looking to build as part of the STEAM Lab Coordinator and Instructional Technology Coach at Cutchogue East Elementary School.

The Long Island Water Quality Challenge, sponsored by the Long Island Regional Planning Council, engaged our students in real world problem solving while fostering the development of many 21st century skills vital to both the current and future success of our students. The Long Island Nitrogen Action Plan (LINAP), led by the New York State Department of Environmental Conservation and the Long Island Regional Planning Council along with Nassau and Suffolk Counties, is an initiative to reduce the amount of nitrogen entering Long Island's groundwater and surface water from wastewater. As part of the LINAP, the *LI Water Quality Challenge* promoted project-based learning in science, technology, engineering and mathematics by helping students develop a greater understanding of how their learning and problem solving can lead to action steps that help protect Long Island's water resources – with a specific focus on reducing nitrogen pollution. This project enabled our students to contribute to the goals set forth in the LINAP, while also further deepening their literacy skills of informational text and their civic mindedness. Students learned about the impact nitrogen pollution has on our water resources and positively contributes to the health of the local environment by engaging in cooperative planning to solve real world issues. Student teams chose from either Low Input Landscaping or Stormwater Treatment as their project focus.

The professional development was intended to support this project and was ongoing, not a singular event, but instead various meetings, both formal whole group, and informal small group conversations. Working with a team of 5 sixth grade teachers, the goal was to facilitate the process of delivering high quality instruction, using Backwards Design as developed in Understanding by Design (Wiggins & McTighe, 2008) and NASA resources to enhance the experience. NASA images were used to assist students to use data to make conclusions about where algae blooms and eutrophication was occurring in relation to shallow water verse deep water. The teachers collaborated in designing the project by identifying learning outcomes to create multi-disciplinary instructional opportunities and provide feedback on instructional materials which included NASA online resources, informational literature, interviews with local environmental experts, and monetary quotes for materials and installation of stormwater treatment options. Teachers defined ways in which their specific content area would work toward the culminating activity of designing either a low impact landscaping or storm water treatment design for our campus. Science teachers developed a lab experiment to determine the impact of nitrogen on algae. The oxygen levels of the water were measured over time. English language Art teachers focused on close reading skills, note taking, and synthesizing notes to develop themes. The math teachers worked with the monetary quotes to determine the cost of material and supplies. They also worked with scale to use proportions to draw a model of the project to scale. As the instructional technology coach, I weaved in opportunities to use technology to collaborate in digital format. The teachers also explored the online NASA resources and determined how they could be used in class, which allowed for videos to increase background knowledge, an interactive game to deepen the students' understanding and lastly, satellite photos and text to visualize the impact of eutrophication.

Feedback from the professional development was collected via Google forms. Feedback of the ongoing professional development was positive overall with an interest to further develop this unit of

study. Qualities that were highlighted were curriculum integration, authenticity of real world problems, connection to community, use of multiple media for research purposes and the facilitation of collaborative learning including the NASA resources. Constructive feedback included a need to pair down the resources, allow for more curriculum development planning time via professional development and to incorporate more integration into the literacy workshop. They also felt that although time was set to plan, as changes were made to the scope and sequence of the curriculum, they were not formula indicated or made deliberate. This was due to time and schedule limitations. This caused some confusion given that this project included 5 classroom teachers.

Two attendees:

Rachael Kazmark, 6th grade ELA teacher, rkazmark@mufsd.com

Geradine Zuhoski, 6th grade Math and Science Math and Science teacher, gzuhoski@mufsd.com

References:

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