

What’s in the Water?



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Part I: Overview of Workplace

The Polk County Conservation Board’s mission is to provide the citizens of Polk County with quality outdoor recreation, conservation education, and long term protection of Polk County’s natural heritage. Created by voters in 1956, the Polk County Conservation focused on the acquisition, protection, and conservation of areas for conservation and public recreation. With many departments, there are over 120 employees of PCC ranging from water quality specialists to environmental educators to maintenance crew to wildlife conservation staff.

Part II: Workplace Focus

The focus of the summer externship was supporting Polk County Conservation’s Water Quality Monitoring Project as their initial five year testing period comes to an end with over 100,000 data points. Since the water quality program began, the testing sites have more than doubled to 70 sites every two weeks. After five years of data collection, they will be ready to establish baseline trends to begin developing water quality improvement plans. The focus of my project was developing data analysis systems and graphical representations to be created to support their development of baseline trends in the water quality of Polk County’s streams and creeks.

Part III and IV: Student Learning Experience and Project

Engage	Experience	Explore	Explain	Elaborate	Evaluate
As an introduction to the project, the students will receive a project file from a scientists in Flint, MI discussing the issues in their water sample. Prior knowledge will include understanding of pH, polyatomic ions, reactions, and water on the macroscopic and microscopic scales.	Students will take a walk to their nearby waterway or field-trip to PCC and experience water quality testing from scientists and experience conducting water quality testing in their local waterways. Next, students will apply their new learning to explore the water quality of Flint, MI to identify the issues in their water.	Students will explore the causes of the water crisis in Flint, MI and local Iowa waterways by researching the causes of water pollution and the effects of water pollution on our environments. Students will also explore methods of reducing water pollution to develop a way to support Flint or Iowa waterways - natural and manmade.	Once students have engaged in water quality learning and explored solutions for water quality issues, students will test and explain the results of their water quality modifications. The students will then also be able to explain further changes they think should be made and explain whether they found their water quality improvement successful.	While many cities in the area have chosen to participate in water quality monitoring, the community leadership directly surrounding the school chose not to participate. Students will be able to elaborate about their learning and experiences with community leaders to engage the community in protecting our water.	Students will develop the ability to evaluate real-world socio-scientific issues so that beyond high school, as young adults, students feel empowered to engage in community issues and access credible sources to understand the choice-making in their community and the subsequent environmental impacts.

Part V: Workplace Solution

The workplace solution required extensive use of a data sheet program (Excel) to create data analysis methods and reports. One standout experience was developing graphical representations that conveyed the data, the meaning of the data, and were accessible to the public. When considering the connection to students, students will be able to develop and apply their graphing skills using computer programs to understand how to read, interpret, and produce graphs.

Part VI: Educational Pathways

Most of the STEM-related careers in my workplace require an bachelor-degree, but the majors varied by position. The most common majors were biology, environment science, environmental engineering, and aquatic science. The careers that these scientists sought were: natural resources technician, environmental educator, naturalist, and water ecologist. Polk County Conservation offers free classroom visits and free programming, so students will be able to meet, learn, and engage with individuals in these careers.