



STEM Certification Executive Summary

Three years ago a problem based learning (PBL) module was developed after DeKalb County Parks and Recreation agreed to let the Tucker High School S.T.E.M. class start to revitalize Kelley Cofer Park and Lake which is located just behind the school. Through weekly observations and data collection, the students identify potential issues facing the lake's overall ecosystem then develop long and short-term solutions to address those issues. The goal of the project is to teach the students by using community service and identifying and addressing these issues facing the park. By using problem based learning, the project becomes the instructor and the teacher is simply a facilitator. This highly effective means of content delivery teaches invaluable problem solving/critical thinking skills that students will take with them as they enter college and eventually careers. Since these are the skills required to compete in a technologically based 21st century, STEM is building our future, one student at a time.

During the program's first year, through weekly data collection trips, students identified five overlying issues that were problems at the lake and park. Potential solutions for each problem were researched and presented by student teams. Through those projects, students identified a potential to create an entire outdoor learning lab at the lake and in the courtyard of the school. This year the 10th grade class used those plans to create and propose four learning areas for the community and feeder schools to use. Also, through those initial observations, students designed nitrate islands are being built and installed to start phase I of our lake clean-up. Students also expanded lake research to aerial surveys using drone technology and trigonometry based calculations. The ninth grade class is using their observations and data collection to address the mosquito population around the lake.

Since the lake has endless opportunities for improvement, developing and maintaining focused approaches and rubrics are a goal for the program. Expansion of learning opportunities to include sustainable energy programs, global impact of water based resources, and integration of additional technology are set objectives moving forward. Continued focus on developing additional community, post-secondary and industry partnerships will be vital as we move forward. We currently have proposals being reviewed by Georgia State, Mercer University, Oglethorpe Power, Georgia Transmission, Motorola, Big Green Egg, and Tucker Business Association. A recently secured grant from Resurgens will not only provide funding for an aquaponics learning area at the school but it will also fund an internship for a Georgia Tech students to mentor the Tucker High School STEM student throughout the project.

In all of the projects, engineering and technology are used to develop and design solution based learning. Although the integration of standards based classroom and the STEM process are an on-going effort, the teachers identified to facilitate the STEM classes are committed to the process. Newly developed STEM committees will join teachers, parents and students to direct future objectives of the program. These committees include communication, web design, fund-raising, curriculum, internships/community partners and student tracking and development. By becoming vested in the process, the STEM educator team will continue to take ownership the program, the community based emphasis, and the student centered projects. Since we are the last leg of the student's pre-college career, educators involved understand and embrace the importance of empowering the STEM student teams to take risk, expand thought processes and grow.