NARRATIVE:

My goal is to provide relevant and quality, project-based science education, with opportunities for hands-on learning, scientific inquiry, and development of critical thinking skills. After student learning styles are determined, I employ different strategies and various activities to accommodate and benefit visual, kinesthetic, and auditory learning styles. This involves the integration of technology in as many aspects of teaching and learning.

One of the projects I have implemented in my Environmental Science classes is the integration of Chesapeake Bay issues in core topics in the curriculum. My students learn about the Chesapeake Bay, its problems, and how to "Save the Bay." To accomplish this objective, I have partnered with the Chesapeake Bay Foundation and the Chesapeake Bay Trust. The Chesapeake Bay Trust partially funds several of my field trips and equipment for water monitoring. My students have opportunities to go on several field trips with CBF where they do hands-on and interactive activities outdoors, as well as use sensing equipment to test Bay water for nutrient pollution, dissolved oxygen, pH, and salinity. Students also learn and practice environmental stewardship by monitoring water quality and macro-invertebrate surveys in creeks close to the school, and engage in service learning activities, such as highway and creek clean-up, BayScaping, maintaining nature trails, and uprooting alien plant species. They also do science fair type projects on various Chesapeake Bay issues and do presentations at school and the nearby elementary school.

I will describe other technology infused STEM activities I implement in my classroom. I divide students into groups of three to study a topic, create their PowerPoint presentations, and share what they learned with classmates. Some of the topics are: nanotechnology and its various applications, cystic fibrosis, forensic cases, and applications of biotechnology. I also have students work in groups to design their self-contained biospheres in the event of an impending ecological disaster. They have to decide where to build it, what supplies to bring and why, and how to sustain it indefinitely.

I designed a lab, during the study of cellular respiration, using sensing equipment to monitor humidity and temperature in my classroom for 24 hours. Results showed that humidity and temperature in the classroom increased with the number of students in the room, and decreased when the room was unoccupied at certain periods. Results are graphed, shown to students on a Smartboard, and trends and patterns are discussed. A few years ago, my students participated in a project that uses GPS technology to map impervious surfaces. We studied how these surfaces impact the environment, how it affects run-off, absorption of heat, amount of dissolved oxygen, and pollution in the aquatic ecosystems.

My students also do a few virtual labs in biology and chemistry. My forensic science students solve virtual crime scenes using newly-developed programs from some universities. They also construct and process their own crime scenes, plan crime-solving strategies, and write investigative reports. These are some of the many activities I implement with limited resources and equipment.