Example ACS-Hach High School Chemistry Grant Proposal
Laboratory Equipment and/or Supplies

Student Impact
105

Collaboration
No

Proposal Summary & Goals
The goal of this project is to introduce visible spectroscopy to students in all levels of chemistry and research. The project is to purchase a Spectronic 200 spectrophotometer and to develop laboratory exercises to introduce students to solution chemistry and rates of reactions in kinetics.

Description
My school offers a range of chemistry classes to our students beginning with a general overview of chemistry called our applied chemistry to a NYS Regent's chemistry class, to an honors level chemistry class and all the way up to the Advanced Placement level. My teaching situation includes teaching two applied chemistry classes, the honor's chemistry, and also the AP chemistry classes at my school during the school day. I also teach a morning research class to students willing to come in one hour before the start of school. This is our third year with the morning class and we have averaged 22 students in the class. These students then go onto doing research projects during the school year.

I would like to purchase a Spectronic 200, a new type of spectrophotometer, to introduce visible spectroscopy to all of the levels of chemistry offered at my school. This new spectrophotometer is so user-friendly and can be used by just about any level of student or instructor. The Spec 200 is durable and would perform accurately throughout the years.

My students would be impacted by this project by introducing them to visible spectroscopy at every level of chemistry. My research students would have the instrumentation to improve their research and it would open doors to doing rates of reaction experiments. Laboratory work in areas of solution chemistry and kinetics would improve and students would learn more in lab. AP chemistry students could then determine the rates of reactions on their own.

To implement this project, I would secure the instrumentation through the grant. I would also attend ChemEd this summer and attend the Thermo Scientific workshops on spectroscopy to learn how to use this instrument and then develop laboratory exercises to implement the instrumentation into the lab. I would introduce the instrumentation to all of my students throughout the year and also encourage the research students to incorporate this type of instrumentation in their research. I would make the instrument available to any student in need of the equipment.

The instrument is self-sustaining in that it does not require much beyond the purchasing of the equipment. All equipment is re-usable. I can purchase the chemicals needed for the experiments with my chemistry budget each year. This instrument could be shared throughout the chemistry department and throughout the region.

Outcomes

This project will help to improve student learning by allowing the student to work in the laboratory, creating varying solutions of different concentrations, collecting data to create a Beer's Law plot, and then determining concentrations of unknown solutions. Students will then be able to use this experience to develop experiments to determine the rate of the reaction using the instrumentation. Students will experience how the rates are determined in a reaction. Right now, data is given to the student and they are expected to determine the rate of the reaction with just data. By experiencing the changes in color, the student will be qualitatively seeing the changes in the concentrations while at the same time quantifying the results.

Research students will be able to use modern instrumentation in their projects. Spectroscopy is so important to the chemist, and yet, we do not introduce our students to this important area of chemistry because of the lack of proper instrumentation. This project will help to bridge that gap.

Evaluation

I will know when the project has met its goals by the laboratory reports submitted by my chemistry students and by the research done by my research students. Class discussions will be implemented to discuss visible spectroscopy and it will include the history of spectroscopy.

Understanding of the concept of rate laws and rates of reactions will be measured by testing on the AP chemistry exam and by classroom testing. I can compare the scores of the students with the test scores of previous students.

Research projects will be submitted by the research students and submitted to the local science fair in March. My goal will be met if the research students utilized the visible spectroscopy in their project and were able to write about the instrumentation in their report and speak about the instrumentation while being interviewed by the science fair judges.

Grant Amount

$1,300.00

Budget

Instrumentation - Thermo Scientific Spectronic 200 Part # 222-265700 with educator discount:	$ 1,250
Shipping and Insurance:	$ 50
Total Cost:	$ 1,300

Vendor: Thermo Scientific, 1-800-532-4752