DEQ Grant Proposal

Project Title: Water Quality Monitoring

Contact Name: John D. Beasley

Position: AP Environmental Science Teacher

School: Tulsa Memorial High School

School District: Tulsa Public Schools

Finance Officer/Phone Number: Casey Koch/(918)833-9640

FEI# (tax ID#): 73-XXXXXXX

Name of Grant Applying for: EE Projects

Address, City, ZIP: 5840 S. Hudson, Tulsa, OK 74135

E-mail Address: beasljo@tulsaschools.org

Daytime Phone: (918)833-9600

Cell Phone: (918) XXX-XXXX

Fax Number: (918)833-9659

Grade Levels/Number of Students Targeted: 11th&12th/26 AP Students

DEQ Grant Proposal
John D. Beasley
Tulsa Memorial High School

Overview:

AP Environmental Science is a lab science. The laboratory equipment currently available to students at Tulsa Memorial High School is incomplete and antiquated. AP Environmental students should have access to current technologies to gain first hand experience in environmental data collection and analysis. The equipment that I would like to acquire for Memorial High would allow students to collect data on soil and water conditions at LaFortune Park in Tulsa as well as to perform hands-on, inquiry lab experiments that demonstrate the effects of various pollutants on soil and water.

Description:

Tulsa Memorial High School has the benefit of being located on the grounds of LaFortune Park. We have access to two creeks and a pond within walking distance of the campus. This year Memorial High is beginning a partnership with the Tulsa County Conservation Districts' Blue Thumb Project. The Hach Test Kits are the same ones used by Blue Thumb. This equipment will allow students to conduct tests simultaneously instead of waiting for others to finish with the equipment supplied by Blue Thumb.

The kick net seine will allow students to collect fish and macroinvertebrates from Little Joe Creek at LaFortune. This will not only provide opportunities for native fish and insect larvae identification but also help to determine stream health based on the species present in the creek.

The Soil Thermometer and Chemical Composition Kit will be additions to other testing equipment at Memorial High to monitor soil conditions at various locations at LaFortune Park.

The Groundwater Contamination and Effects of Phosphates and Nitrates Labs are inquiry based. These labs have been conducted before and have been modified to allow greater inquiry by encouraging students to determine the amounts of "pollutants" or "contaminates" to the testing samples and thus have unique results to compare to other classroom data.

Goals and Objectives:

The purpose of AP Environmental Science is two fold. The first is to prepare students for the rigors of university course work. The students will write lab reports for each field and lab activity. This gives them needed experience in writing proper scientific lab reports. Second, the AP students at Tulsa Memorial are the future community leaders of the City of Tulsa and the State of Oklahoma. As environmental issues gain an increasing importance in American society, the goal of this program is to ensure an environmentally educated and enlightened electorate. Additionally, this equipment will enhance the student's field work with Blue Thumb by allowing them to gather a greater quantity and quality of data used to analyze creek health and to track seasonal and annual changes at Little Joe Creek.

DEQ Grant Proposal
John D. Beasley
Tulsa Memorial High School

Implementation:

These projects will be implemented by students in the form of inquiry labs, field collection of samples, data collection, and data analysis. The equipment will give students an opportunity to use technologies used by professional environmental scientists. This will provide kinesthetic and naturalist students reinforcement on important topics covered in the textbook and discussed in the classroom. Expansion of these projects can be included in general environmental science and aquatic biology which will be taught at Memorial beginning the academic year of 2008-09.

Timeline:

The Hach water quality monitoring kits will be used immediately. These kits will be used at least once a month throughout the year including June, July, and August. The kick net will be used in conjunction with the Oklahoma Conservation Commission's macroinvertebrate collection events this winter as well as independent collections from Little Joe Creek. The two investigative lab kits (PO_4 & NO_3 and Groundwater Contamination) will be used at the beginning of the next academic year to introduce students to the concepts of water pollution and eutrophication. The soil testing kits will be used in the spring when the topic of land management is taught.

Budget:

Hach Dissolved O_2 Test Kit Product #146900 $56.89
Hach Nitrogen Test Kit Product #224100 $64.89
Frey Scientific LaMotte Water Studies Guide #15586320 $13.95
Frey Scientific LaMotte Kick Net #15531531 $57.00
Frey Scientific Soil Chemical Composition Kit #15574779 $122.00
Fisher Pollutant Effects of Phosphates & Nitrates Kit #S19358 $55.00
Fisher Exploring Groundwater Contamination #S32003 $82.95
Fisher Soil Thermometer #S45114 $5.90
Total: $458.58

DEQ Grant Proposal
John D. Beasley
Tulsa Memorial High School

Evaluation:

This is an ongoing project at Memorial High School. The monitoring of Little Joe Creek is continuous and cannot exclude June, July, and August. Therefore, students that enroll in AP Environmental Science will have the opportunity to participate in environmental monitoring during the summer before they start the AP course. As this equipment will be used throughout the school year, each student must use each piece of equipment at least one time in a field setting, displaying both a mastery of the equipment and an understanding of the purpose of each test conducted. For example, when testing nitrogen levels in an urban creek, students will discuss the potential sources of nitrogen, the impact of nitrates on creek health, and eutrophication. This will enhance their comprehension in preparation for the AP test at the end of the academic year. More importantly, it provides students with a basis to understand local environmental issues such as the impact of nitrates and phosphates from poultry litter and their impacts on the Illinois River Watershed, soil contamination at Tar Creek in Ottawa County, and urban watershed eutrophication due to excess fertilizer use in landscaping.

Note: We were unable to include John's support letter from his principal due to formatting problems.