

ABSTRACT

Nederland Middle Senior High School qualifies for funding from the Senate Bill 96-197, Excellence in Learning Through Technology as a rural school.

The mission statement for Nederland Middle Senior School is :

In our school all teachers, staff, parents, and patrons will work together as a caring, trusting team sharing our unique talents and resources to provide an environment for each individual to be valued, to grow, and to achieve success.

The moneys this school is requesting will allow access to technology to all populations equitable to other schools in the district. With request to the Boulder Valley School District Science Content Standards, Nederland Middle Senior High School is highly motivated to reform their Science Department.

Recently a bond issue was passed to build an addition to and remodel our building. This shows community support for improvement and a move forward with the support of a technology plan. This bond increased the availability of technology in our building for Math and Writing. Funding from the Excellence in Learning Through Technology Grant would greatly enhance our ability to move towards meeting the Science Content Standards in our district.

The focus of this proposal is to provide technology within our Science Department. Teachers will attend training sessions to become proficient with the technology and learn ho to integrate this technology into their classroom.

These funds will be used to procure equipment and tools for learning for our science laboratory, training for teachers, curriculum for students and provide analysis of student progress.

The funding from this grant would enable Nederland Middle Senior High School to further the mission of the school and of Boulder Valley School District by enhancing the ability of the Science Department to address all learning styles and provide more academic rigor.

NEED FOR THE PROJECT

At present, our Science Department has very limited technological resources. We serve students in grades 7 - 12. We only have only one set of equipment that can be used for demonstration purposes. We do not have appropriate hardware or software that would allow student participation. Our teachers do not have training or curriculum that incorporates technology. In order to meet the Science Content Standards set forth by Boulder Valley School District, our Science Department requires hardware, software, training and curriculum.

The technology funding within our building and our district was allocated to Math and Writing. The Science Content Standards for Boulder Valley School District state that students shall be able to design, conduct, communicate about and evaluate scientific investigations. In order to meet this standard, we must purchase and be trained in using the proper equipment to conduct such investigations. With a Microcomputer Based Laboratory (MBL) students can perform sophisticated experiments, collect and manipulate data, share their findings with classmates and do in depth analysis of natural phenomena.

Nederland Middle/Senior High School is unique in Boulder Valley School District. We are the only rural school with students attending our school from a 200 square mile radius. Our building houses grades 7 - 12, but is relatively small. Our total student body numbers approximately 430 students. Because of this small size, acquiring resources is difficult for us. While our funding per student is the same as the rest of the district, we have fewer students; therefore, our total dollars are less. We must seek funding from other sources in order to ensure the same quality of education in our building as those in the remainder of the district.

Our community is not a high tech community, but is very supportive of endeavors by the school to teach our students how to use and understand all available technology. This is demonstrated by the recent bond issue and by parent involvement in our school.

Technology in the classroom is a substantial component of the National Standards and those of Boulder Valley School District. One component of the Boulder Valley School District standards is that students shall know how to select, safely handle and correctly use laboratory materials and equipment. They shall know how to access information using electronic resources. A micro-based laboratory (MBL) is a system that will allow this to happen across all disciplines of science. The many probes and extensive curriculum will enhance student understanding of such topics as chemical reactions, motion and energy. Students will also actively participate in investigations of projectile motion, pendulums, and chaos theory. In the area of life sciences, photosynthesis and acid rain may be studied.

One of the goals of our technology plan is to increase classroom productivity. This program will allow the implementation of more labs during class time. The labs will be organized as cooperative learning groups. As a result, all students can participate on a regular basis. Research has shown that females tend to participate more when this method of teaching is used. When a MBL is used, more time is available for analysis and understanding of the material due to the collection and manipulation of data being done by the computer.

GOALS AND OUTCOMES

One goal of our school is to have the ability to meet the Science Content Standards as soon as possible. With the funds from this grant we would be able to accomplish the technology piece during the 1997 - '98 school year. With the technology, we can obtain the goal of teaching students how to correctly use scientific laboratory equipment.

In addition, Nederland Middle Senior High School is committed to dramatically increase the availability of scientific methodology to students using technology. Productivity in the laboratory will be increased due to computers performing the data manipulation, enabling students more time to concentrate on scientific principals and concepts.

A desired outcome of this project is an increase in the number of students taking high level science. With a more hands-on approach to science, many students who lose interest in science past the graduation requirements could find science to be more relevant to their day to day lives.

ACTIVITIES AND TIME LINE

Within one month of obtaining funding, we will begin the process of organizing the Science Lab. A work order will be given to the district office in charge of wiring the lab. At that time, we will also place on order the MBL's and computers.

Within 6 months of receiving funding, our lab will be wired and all hardware in place. We will begin software installation at that time. After installation is complete, teacher training will be scheduled. By 15 months after monies are obtained, all hardware and software will be installed and working and all teachers will be trained on the use of the equipment. The scheduling of classes into the Science Lab will begin at the beginning of the first quarter when all equipment and training is in place.

PURPOSE OF THE PROJECT

The students in our school community have very limited access to technology. Our school is small and so are the funds. By implementing this project, our students will have access to laboratory quality equipment and the ability to collect and manipulate data in an efficient, precise way using modern methods.

By using MBL's, less time is required to collect, record and manipulate data. More time will then be available for the analysis and understanding of scientific phenomenon.

There is a MBL developed, manufactured and supported in Boulder, Colorado. The purchase of this equipment would be in support of Colorado economy.

The teachers at Nederland Middle Senior High School will have in place a method to measure the amount of usage of the equipment including date, teacher name, type of experiment and the number of students participating.

In order to expand the technology capabilities in our school, this project will include computers, a server, teacher training, curriculum and wiring of the science lab to accommodate this set up. It will also include furniture necessary in order to most efficiently use the allotted space.

PARTNERSHIPS

A partnership will be formed with Team Labs Corporation, a local developer of science curriculum, software, and probeware products. Our science classroom will benefit by becoming a test site for future science curriculum and software products developed by Team Labs.

IMPACT

By obtaining these funds and implementing this program more students will be able to participate in hands on learning. They will be able to eliminate some of the time consuming aspects of scientific learning and concentrate on the information available. Students who learn best by doing will be able to enhance their experience in the science classroom.

At present, we do not have the ability to allow a classroom of students to participate at the same time in the same project and share all the data. This project would allow 9 stations of 3-4 students each to participate in the

same learning experience and share the data among networked computers. There will also be an identical station for the teacher to accommodate student instruction. An added benefit will be more sophisticated Science Fair projects.

EVALUATION AND ASSESSMENT OF THE PROJECT

The increase of students taking high level science will be measurable by the 1999-2000 school year. A report of students in the high level science classes will be available.

Teachers will evaluate the project through observation of students using the equipment, their grades and their overall classroom participation.

SUSTAIN ABILITY

This science lab will be in place after the grant period is over. We will be purchasing leading edge technology that will not soon be outdated. The curriculum is pertinent to each science discipline and will remain available for science study for years to come.

PSL has a warranty that will cover damage to equipment for 3 years. Team Labs will continue to support their hardware and software. As new science teachers come on board, our present teachers will train them in the use of the lab.

Budget Narrative

PRICE	QTY	DESCRIPTION	JUSTIFICATION
\$4,282		PSL Integrated Science Pak with Books	contains user license, software, experiments guides for teachers and students, sensors and probes
2,845	9	PSL Integrated Science Pak - Probeware Only	Sensors and Probes for 9 additional student stations
500	1	HP Deskjet 870Cse	For student use for reports and presentations
2,500	11	Micron Millennia P200 Computer	1 server, 1 teacher station, 9 student stations (3 students/station)
160	12	Ethernet Cards	To connect the teacher and student work stations to the server in the classroom and to the school network
2,600	2	WinBook XP5 Notebook Computer	To facilitate outdoor data collection
200	1	Back-up Tape for Server	To back-up server daily to maintain integrity of data
456	1	Colorado Memory' Systems T4000	Tape Drive for Server
200	11	1 6M Memory Upgrade	To allow systems to remain current for many years
4,500	1	InFocus Lite Pro 210 LCD Projector	For use in teaching and student presentations
400	1	Logitech PageScan	To allow in classroom copies
2,495	1	Carolina Intermediate Microvideo Package	To provide the ability for all students to simultaneously view a microscopic presentation
1,000		Diskettes, cables, tapes, paper, ink and misc supplies	Required to initiate use of systems.
3,008		Software	To increase usage of computer systems and resource materials
855		Shipping and Handling	
3,000		Computer System Installation	
2,250		On Site PSL Training	3 days teacher training on equipment

APPENDIX A: PARTNERSHIPS

Team Labs Corporation
6390B Gunpark Dr.
Boulder, CO 80301
(303) 5304043

A partnership will be formed with Team Labs Corporation, a local developer of science curriculum, software, and probeware products. Our science classroom will benefit by becoming a test site for future science curriculum and software products developed by Team Labs.

Team Labs will receive \$30,175 for science curriculum, software and probeware. In addition, they will receive \$2,250 for teacher training.

APPENDIX B: QUALIFICATIONS OF STAFF

Laura Marts is currently the Science Department Head at Nederland Middle/Senior High School. She has been teaching science either as a substitute teacher or a regular teacher since 1986. She has trained and supervised teaching assistants.

Matt Grigaitis has been teaching Science since 1982 and has been at Nederland Middle/Senior High School since 1995. He has taught using cooperative learning groups, labs and computers.

APPENDIX C: LONG RANGE TECHNOLOGY PLAN

APPENDIX E: LETTERS OF SUPPORT

December 6, 1996

re: Technology Grant and Revolving Loan Program Dear Sirs:

As parents of a Nederland High School Student and long time members of this community, we would like to extend our support for this application submitted to you to build a new science lab at Nederland High School.

We are a small school within the Boulder Valley School District. Our numbers are small, therefore our per capita funding is small also. We struggle to stretch the dollars we receive to provide our students with classes, equipment, and services that bigger schools are more able to provide because of their larger head count. It is a constant effort on the part of parents, staff and principal. We rely on grants to keep our school updated, especially in the area of technology. We are constantly striving to give our students a first class education.

Our school has not only a growing science and math department, but a growing number of students needing and wanting more classes in these areas for college entrance requirements. We are offering more science classes now than ever before, yet our facilities are outdated and lacking new technology. The number of seniors going on to college and post-secondary educations is increasing each year. I believe that last years class had about 75% going on in school. We see only an increase in the number of students interested in upper level science classes. We desperately need to be able to accommodate these students and encourage them in these areas.

Because we are a small community Nederland has about 1000 people, the surrounding rural area about 5000), we have no other resources besides our schools for our students to go to. Boulder is our nearest town with labs, libraries, etc. It is a 20 mile drive from the school (and double from some homes) on sometimes dangerous and slippery Boulder Canyon. At this time, some of our students go to the University of Colorado for some science and math classes. It is a difficult task for them to balance classes, drive time, and time away from the High School. We need to work towards offering these classes here, in our school, in facilities on our own campus.

We are a dedicated and proud community of parents, teachers and students. We work hard for the money for our school I can guarantee that not only is this grant essential to our future and our students future, but that it would be used to its fullest and greatly appreciated in our school.

Wendy and Andrew Cookler
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