CURRICULUM FUNDING PROJECT

Funding Agency: ________________ NATIONAL SCIENCE FOUNDATION ____________________

Funding Request: $ __100,000________ for ____THREE (3)____ years.

Principal Investigator:

____ LAURIE AIELLO ______ SANTA SUSANA HIGH SCHOOL_ (SSHS)________

Co-Investigators:

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BIOLOGY & CHEMISTRY TEACHER FROM SS HS

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SCIENCE TEACHERS FROM SIMI VALLEY UNIFIED HIGH SCHOOLS

Project Name: ___”INVESTIGATING SCIENCE THROUGH FORENSICS”________

INVESTIGATOR CREDENTIALS/PROPOSERS:

I currently teach biology at Santa Susana High School (SSHS) in Simi Valley, California. The school has recently received a Smaller Learning Communities Grant and has formed three academies which are in the arts, technology and academics. I have worked under the grant and I currently hold the position of Director of the Academic Academy. I have also served on the Simi Valley Unified School District (SVUSD) science curriculum committee. Additionally, I have been a Support Provider in the county’s Beginning Teacher Support and Assessment (BTSA) program for new teachers.

In the past in Los Angeles Unified School District (LAUSD) I was an active participant in Los Angeles System Initiative (LA-SI) phase one, two and three trainings from 1995 through 1998 where I developed Integrated Coordinated Science (ICS) curriculum for piloting in
LAUSD. The curriculum development training was funded by the National Science Teachers Association’s (NSTA’s) Scope, Sequence and Coordination (SS&C) of secondary schools, University of California Los Angeles’ (UCLA’s) Project ISSUES (Integrated Systems for Studying Urban Environmental Science), and the Urban Systemic Initiative funded by the National Science Foundation. In 1998 I conducted a workshop using equipment in an originally designed lesson for an integrated science module for LA-SI phase one and two teacher participants.

In 1997 I received an Innovation Grant from Los Angeles Educational Partnerships for $500 funded by the Toyota USA Foundation for curriculum development of recycling batteries in the classroom.

Because I have had experience in working with other science teachers and have developed extensive curriculum at the district level, I feel qualified to develop an integrated course that will cover biology and chemistry standards for SVUSD.

Over the length of this three year proposal, I would like to recruit and work with other teachers in my school and in the other two high schools in SVUSD in an effort to develop an interesting, challenging and motivational science course for the secondary high school level. When new courses are developed in a district, it is important to align the curriculum throughout the district to insure that district and state standards are met. I would also like to elicit active participation from the community by seeking consultation from investigators in the Simi Valley Police Department’s (SVPD’s) Investigative Division, scientists from the Technical Associates Incorporated (TAI) forensic science consultation and laboratory testing center in Ventura county and doctors from the Ventura County Medical Center (VCMC). Also, with professors from California State University Channel Islands (CSUCI) I would like to seek guidelines for the
development of a “forensics science” course which incorporates biology and chemistry standards and curriculum at the high school level and prepares the students for college science courses.

**BACKGROUND**

SSHS is located in the city of Simi Valley (population approximately 120,000) which is approximately forty-five miles northwest of Los Angeles in Ventura County and encompasses the communities of Simi, Santa Susana and Susana Knolls. Simi Valley has served as a commuter community since the city’s growth began in the early 1960’s. Currently the city is experiencing a rapid increase in light industry, technology and retail businesses. SSHS is one of four high schools in the Simi Valley Unified School District (SVUSD). There are two traditional comprehensive high schools, one continuation school, and SSHS which is a small school (about 1120 students) of choice with no district boundaries (School Accountability Report Card, 2005). Last year, 2005, SSHS had the highest API score of the district (807), with a state-wide ranking of eight (8) and a similar schools ranking of nine (9) (SSHS WASC Report, 2006).

**PROBLEM STATEMENT**

Although SSHS has a very high API score and has grown beyond the middle school campus upon which it was formed, many students lack the desire to perform to their potential. Particularly, students lack interest in the sciences. For years the number of students enrolling in undergraduate and graduate science programs at the college level has also been decreasing. California ranks below all but one state in sending high school seniors to four-year colleges with only 23% of high school seniors enrolling in 4 year colleges (Rogers, Terriques, Valladares, & Oakes, 2006). One of the problems seems to begin in the secondary schools. Students are taking
less rigorous science classes during their high school years and are choosing to take those courses which do not meet the University of California's (UC's) "a-g" subject area requirements. At SSHS only 29.5% of seniors in the Class of 2006 are on target to meet the requirements for admission to the University of California or California State University (SSHS WASC Report, 2006). Students seem to lack interest in the scientific fields and are less prepared for college level coursework. If students had the opportunity to study more interesting and challenging coursework in high school science, they would be more likely to continue studying the sciences when they enter a college or university.

This project proposes to add a district-wide pilot program of dynamic science curriculum centered on a theme of "forensics investigative science" in order to increase student interest and achievement in the sciences as well as to encourage students to pursue science at the college level. An increase in transfer, the ability to move ideas from one area to another, can be enhanced through a course which shows practical applicability of science to real world situations as found in the field of forensic science. When students can see the relevance of the curriculum and how it can be used in everyday life, transfer is enhanced (Bransford, Brown, & Cocking, 1999).

The high schools in SVUSD, including SSHS, still offer general courses in science. The school and the district are currently pushing to have more students meet the UC’s "a-g" subject area requirements with college prep courses instead of general level courses. However, many students throughout the district lack the interest and drive to take the offered college preparatory courses in high school and lack the desire to attend a four year college after high school. The importance of preparing students for college is to encourage students to become "lifelong learners prepared to succeed in today’s world" (Goals 2000, 1993). Building a foundational
competency which requires basic reading, writing and mathematics skills along with thinking
skills which include creativity is an important focus in science education and a major goal in the
development of this course’s curriculum. Decision making and problem solving can result in
competencies as defined in the SCANS Report 1991 which reinforce the processing of
information, and the ability to evaluate and understand systems and the ability to use technology
in the workforce. By incorporating key scientific concepts and lab experiments into creative,
forensic-based mysteries and activities, this course can provide a way to engage and teach
students about the expanding and fascinating world of forensic science (Court TV, 2006).
Additionally, with assistance from CSUCI, the development of a “forensics science” course
which incorporates biology and chemistry standards and curriculum at the high school level can
also prepare students for success in college science courses.

ACTIVITIES

This three year proposal will include the development, implementation, and assessment
of a course titled “Forensic Science” for SVUSD. The first year will involve development of the
course. In the second year the course will be implemented at one or more high schools in
SVUSD. The third year will be used to assess and recruit more schools and more students into
courses throughout the district as well as seek additional funding to keep the courses sustained
for the future with possible implementation in neighboring districts.

The Principal Investigator will recruit another biology or chemistry teacher at SSHS and
a science teacher at one of the neighboring high schools to research and gather curriculum which
is tied to the standards and to forensic investigation. Working together with professors from
CSUCI the curriculum can be aligned to provide optimum course work and a sound foundation
for college level science courses. Examination and evaluation of an appropriate text, lab manual, lab kits and equipment is also necessary.

A district course outline is to be written and submitted to the district. The outline will include pre-requisites and/or co-requisites for the course, course overview, course objectives, methods of evaluation, and primary and supplementary textbooks. The course will also be tied to the district biology and chemistry standards which are also the state science standards.

After the outline is submitted and approved, three high school teachers, one at SSHS and two from a neighboring high school in SVUSD who have volunteered to pilot the course will undergo training and curriculum development which includes simulated crime scenes that apply chemistry and biology state standards to the laboratory investigations designed to solve the “crimes”. Assessments will also be written to use for each unit and each semesters’ final exam.

Implementation of three “Forensics Science” courses, one at SSHS and two at another high school in SVUSD, will occur during year two. Students will engage in a year-long college prep level forensics course that will incorporate biology and chemistry standards. Students enrolled in the course will study forensics in sequential format which will incorporate a lecture component, lab experiments, individual and group work, guest speakers, field trips, and possible student internships. Students will complete eight units over two semesters which will cover:

- A unit overview
- Recognition of standards that apply
- Introductory and background information
- Associated lab activities and procedures
- A motivational mystery setting
- Creation of a final “Investigative Finding Report”
- Application to real life forensic science
Student progress will be assessed via successful completion of lab experiments and an official Crime Lab Report write-up for each unit. Class discussions will also include the evolution of forensic science and explanations on how it is used today to help solve cases.

Howard Gardner, a cognitive and educational psychologist from Harvard University and author of *The Unschooled Mind*, states that the single most effective criterion for effective education is “an education that yields greater understanding in the students”. Gardner further states that tests and oral responses in the classroom can provide a glimpse of what the students understand. The course will be designed to encourage discussions and assessments which monitor student achievement. However, to get firm evidence that the understanding is significant, it is necessary to look more deeply through presentation of new and unfamiliar problems, open-ended interviews and careful observations (Gardner, 1991). One of the goals of this course is to provide situations which facilitate development of skills which lead to understanding.

Students will have an opportunity to listen, interview, and prepare a written review on guest speakers from CSUCI, the police department and the VCMC county morgue. This component of the proposed course will help students actively apply their knowledge which will allow better assessment of student learning (Ravitch, 1995). At the culmination of the semester, students will take a field trip to the TAI forensic science consultation and laboratory testing center in Ventura County. College counselors from CSUCI will also be invited to present enrollment and possible internship opportunities to the students.

Formative assessments to determine the progress towards the goals of this proposal will include student enrollment, teacher evaluations, teacher logs, student reports and evaluations. Student interest in the course will be determined by enrollment in the course. Teachers will be
asked to evaluate the course for content, preparedness and equipment uses. Teachers will keep a journal/log on the development and use of the curriculum to help train future recruits and modify the course as needed. Student reports on field trips and guest lecturers will indicate if the students have reached appropriate learning stretches. Student evaluations of the course will determine interest in science and include their college choices including science and non-science majors.

Summative assessments for the ultimate success of the course will be given for each unit and a final exam for each semester will be designed and given to determine student achievement in the course. In addition, student achievement on college entrance exams and SAT II scores will be reviewed for correlation between student achievement in the course and student success on assessments. Surveys will be given to students about their choices for college enrollment. Drop out rates before, during, and after the third year of this proposal will be used to support evidence of student interest. A pre-test and post-test which includes biology and chemistry standards will be given to determine if the course is addressing the standards.

Year three will be spent articulating between the two high schools where the courses are being taught and guiding the third high school through implementation of the course. Additionally, there will be continued assessments of the courses being taught in the district and recruitment trips to neighboring districts. Workshops and showcases will be used to demonstrate the curriculum and to recruit other teachers at other schools. Presentation of a workshop regarding the course highlights at the National Science Teachers Association (NSTA) conference will be made to encourage future development of the course. Research for additional grants to maintain and fund future implementation of “forensics courses” at the high schools in SVUSD and neighboring districts will also be implemented.
TIMELINE

Year One

Summer - The principal investigator and two other teachers will conduct research and development of course overview, curricula, textbooks, lab manuals. Resources for instruction from the community and CSUCI and CourtTV will also be researched. A course outline will be written for submission to the district.

Fall - A district course outline for a fourth year science elective class will be submitted for approval to the curriculum council of the district. The course will be a year long science course for 10 credits titled “Forensic Science”. Approval is needed from the director of secondary education and the Deputy Superintendent for educational services.

Spring - A course outline will be presented to students during their advisory period. Student interest surveys will be completed to determine recruitment and to fill classes. Books and equipment will be purchased (see “Resources” on page 13 of this proposal). Articulation in the community will involve the SVPD, TAI, and CSUCI in preparation for guest speakers, field trips, and special lessons. Investigation into requirements by CSU for success in their forensics science program will be sought to enhance the development of curriculum in order to support student success at the college level. Attendance for the PI and two other teachers of the “forensics science” courses at the NSTA Conference will be scheduled to research curriculum, textbooks, and equipment possibilities for the new course.

Year Two

Summer - Refinement of the course outline and development of instructional units by PI from SSHS and two recruited teachers from one neighboring high school.
Fall - Implementation of one pilot program at SSHS by PI, and two courses at one of the other high schools in SVUSD will begin. Release time will be given to the PI and two other teachers for collaboration between the two schools on curriculum and progress of the courses. This will include release days to reflect on curriculum, make modifications, develop and analyze assessments, share ideas, and provide collaborative input.

Spring - Additional release time will be provided for continued collaboration between the teachers. Review of unit tests, final exams and student work will be used to determine student achievement in the course and make modifications. Student surveys will be and will focus on college/career choices. Planning and execution of a field trip to forensics laboratory in Ventura. A compilation of course highlights will be assembled to present during open house to showcase the new course for the district and the community. Two additional teacher recruits for the “forensics science” course will attend the NSTA Conference to supplement curriculum, textbooks, and equipment possibilities for the ongoing course. An application to present the course highlights and curriculum at NSTA Conference in the fall of year three will be submitted.

Year Three

Summer - The PI and two teachers will evaluate student assessments from the courses to determine which standards are being addressed. Review of teacher evaluations and logs will be used to determine which areas need modification. Data on students who graduated and their career/college choices will be compiled. Recruitment and training of three additional teachers for three additional courses at SSHS and both of the other high schools in SVUSD. A total of six courses in the district is the target goal. Ongoing refinement of course curriculum. Purchase of equipment, books and supplies for the additional three classes being implemented. The principal investigator will prepare a presentation highlighting the course for NSTA Conference in the fall.
Fall - Student alumni from year two will be contacted for a survey on the relevance of “forensic science” class at the high school level. Implementation of the three new programs at the high schools in SVUSD will begin.

The principal investigator will be given an additional planning period to:

- Coordinate collaboration between the schools on curriculum and progress of the course throughout the year including release days to reflect on curriculum, make modifications, develop and analyze assessments, share ideas, and provide collaborative input.
- Coordinate field trips and guest speakers.
- Develop future grant proposals to sustain courses already implemented and to create future courses in neighboring districts.
- Research student opportunities to apply for internship programs in research or forensics laboratories and at CSUCI.
- Present course highlights at NSTA Conference of “Forensics Science” in spring.
BUDGET

Summer pay
For curriculum development
Year 1 - PI and 2 teachers $30.68/hour x 6 hrs x 10 days = $5522
Year 2 - PI and 3 teachers $30.68/hour x 6 hrs x 5 days = $3682
For evaluation
Year 3 - PI and 3 teachers $30.68/hour x 6 hrs x 5 days = $3682
For training
Year 3 - 3 new teachers $30.68/hour x 6 hrs x 5 days = $2761

Stipends for teachers to participate in development and implementation of new course
Year 2 $1000/year x 3 participants = $3000
Year 3 $1000/year x 6 participants = $6000

Substitute pay during school year
Year 1 - PI for planning $120/day x 6 days = $720
Year 2 - PI and 2 teachers for collaboration $120/day x 4 days = $1440
Year 3 - PI and 5 teachers for collaboration/evaluation $120/day x 4 days = $2880

Professional/Expert Consultant & Guest Speakers for 3 years
$25/hour x 20 hours = $500

Buses for Field Trips
Year 2 $1500 x 2 = $3000
Year 3 $1500 x 3 = $4500

NSTA Conference Attendance
Year 1 - PI and 2 teachers registration $500 x 3 = $1500
    Lodging $150 x 2 nights x 3 people = $900
    Meals $30/day x 2 days x 3 people = $180
    Travel/Flight $300/person x 3 people = $900
Year 2 - 2 teachers registration $500 x 2 = $1000
    Lodging $150 x 2 nights x 2 people = $600
    Meals $30/day x 2 days x 2 people = $120
    Travel/Flight $300/person x 2 people = $600
Year 3 - PI and one teacher to present at conference registration $500 x 2 = $1000
    Lodging $150 x 2 nights x 2 people = $600
    Meals $30/day x 2 days x 2 people = $120
    Travel/Flight $300/person x 2 people = $600

Year 3 Planning Period for PI $22,000

Textbooks 64.97 x 30 copies x 6 courses = $11,694
Teacher resources $200 x 6 courses = $1,200
DVD $29.98 x 6 courses = $180

Lab Equipment
Kits $289.95 x 8 lessons x 6 courses = $13,918
Master Activity $624.00 x 6 courses = $3,744
Refill Kit $199.00 x 6 courses = $1,194
Miscellaneous glassware/chemicals = $264
    Total = $19,120

Total Proposal = $100,000
RESOURCES FOR “FORENSIC SCIENCE” COURSE

Boreal Laboratories
http://www.sciencekit.com/

“Forensic Curriculum Stations Kit, Crime Scene Evidence Collection, CD-ROM Version”
WW6799701 Kit, Crime Scene Evidence Collection, CDROM Version, Forensic Curriculum Stations (FoCuS), Station 7
$330.00
http://boreal.com/category.asp_Q_c_E_535459

“Forensic Curriculum Stations Kit, Crime Scene Evidence Collection, Printed Binder Version”
WW6799700 Kit, Crime Scene Evidence Collection, Printed Binder Version Forensic Curriculum Stations (FoCuS), Station 7
$289.95 Need 1 kit per lab
http://www.sciencekit.com/category.asp_Q_c_E_479067

Court TV “The Best of Forensics Files”
12 episodes on 2 DVD’s! The DVD also includes special features such as an interactive forensics lab, a forensics quiz and techniques, criminology web links, and DNA crime-to-conviction information.
CT1410 $29.98

Court TV “Forensics in the Classroom” Standards based curriculum in the classroom – free.
http://www.courttv.com/forensics_curriculum/

Ward’s Natural Science
http://www.wardsci.com
WARD’S Forensic Curriculum Activity Set 1
36 V 6246 WARD’S Forensic Curriculum Activity Set 1 $675.00
36 V 5897 Master Forensics Lab Activity $624.00
36 V 6426 Master Forensics Lab Activity, Refill Kit $199.00

Prentice Hall
Criminalistics: An Introduction to Forensic Science, Saferstein
0131137069  Student Edition $64.97
0131961438 Lab Manual  $20.97
http://phcatalog.pearson.com/program_single.cfm?site_id=6&discipline_id=812&subarea_id=1255&program_id=14366
REFERENCES


RESUME

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LAURIE AIELLO

WORK EXPERIENCE

Teaching Experience:

• Santa Susana High School 1998 - present
  Simi Valley, California
  Simi Valley Unified School District
  Subjects Taught: Integrated Science, General Biology,
  CP Biology, Honors Anatomy & Physiology

• Chatsworth High School 1996 - 1998
  Chatsworth, California
  Los Angeles Unified School District
  Subjects Taught: Biology, Sheltered Biology,
  AE Biology, Life Science, and Integrated Science

Registered Veterinary Technician

• LaCañada Pet Hospital 1983 - 1985
  LaCañada, California

• Hillcrest Pet Hospital 1980 - 1983
  Montrose, California

EDUCATION

California State University Northridge
  MA in Education, Emphasis in Science With Distinction

CLAD Crosscultural Language and Academic Development Certificate

CSU Northridge Teaching Credential: Single Subject Life Science
  Supplemental: Chemistry

CSU Northridge  BS Degree in Biology Cum Laude

Pierce College Woodland Hills, CA  AS Degree

Glendale College Glendale, CA  AA Degree

Graduated Crescenta Valley High School, CA  Valedictorian

PROFESSIONAL MEMBERSHIPS

CSTA - California Science Teachers Association

BTSA Provider - Beginning Teacher Assessment and Support Provider,
  Simi Valley Unified School District, California

RVT - Registered Veterinary Technician, California