



Oregon University System

ETIC Pre-college Program Proposal 2007-2009 Biennium

Table with 2 columns: Field (OUS Campus, Proposal Title, Abbreviated Abstract, Amount Requested) and Value (Oregon State University, Career-Linking in Rural Middle Schools, project description, \$116,000). Includes an 'Awarded:' field.

Table with 2 columns: Field (Campus ETIC Member, Title, Phone and Email) and Value (Dr. Ronald Adams, Dean, College of Engineering, Ronald.lynn.adams@oregonstate.edu).

Table with 2 columns: Field (Program Contact, Title, Address, Phone and Email) and Value (Dr. Larry G Enochs, Professor, Science and Mathematics Education Department, 233 Weniger Hall, Oregon State University, Corvallis, OR 97331, 541-737-1305, Enochsl@onid.orst.edu).

Table with 2 columns: Field (Accounting Contact, Title, Phone and Email) and Value (Peggy S. Lowry, Oregon State University Authorizing Official, 541-737-4933, peggy.lowry@oregonstate.edu).

Deadline for completed proposals: Friday, May 25, 2007 at noon.

Email proposals to michele\_vitali@ous.edu.

Engineering & Technology Industry Council Oregon University System 18640 NW Walker Road #106

Date Stamp - for ETIC use

## **1) Program Information**

### **a) Program abstract**

This project, the Department of Science and Mathematics Education (SMED) and Science & Math Investigative Learning Experiences (The SMILE) will partner to implement a career-linking curriculum in twelve rural schools in Oregon. This project seeks to motivate students to develop stronger career awareness, confidence in learning math and science, and interest in related careers for all students. Career infusion curriculum will be developed and implemented in the project schools. Gains in motivational variable will be measured.

### **b) Program goals and outcome objectives**

The purpose of this program will be focused on linking science and mathematics content with related careers. This program will be for one year. The intervention, Career Linking, specifically is designed to provide students with sources of motivation in career awareness and math and science performance. Career Linking is a model designed to promote the infusion of career information into the middle school curricula (Fouad, 1995). The project staff will adapt this Career Linking model for use in the SMILE schools and rural context. The target audience will be rural middle school teachers and their students. The model includes modules of 6 week activities for students the weekly activities are as follows: Week 1. Introduction. Week 2. Large group field trip to business; Weeks 3. & 4. Volunteer Speakers; Week 5. Shadowing; and Week 6. Closure. Each has an emphasis on student accountability and behavioral expectations for students. We will call on community volunteers and OSU engineering students to visit and speak in the classrooms as part of the model. Although many efforts have attempted to improve students' motivation to pursue math and science careers, few have documented measurable success. This effort is based on theoretical foundations that can measure such success.

Goals:

- To provide students with experiences that will motivate them to learn content rich science and math;
- To provide students with experiences that will make them more informed about careers and career decisions;
- To provide students with activities that give them more confidence in learning math and science;
- To assist students in setting career goals;
- To provide teachers with the necessary knowledge and practice to implement the career-decision model; and
- To enable teachers to share and assist other teachers in implementing the model.

Outcome Objectives

- Students' grades will improve;
- Students' interest in science and mathematics will be higher;
- Students' confidence (self-efficacy) will be higher in terms of learning math and science;
- Students' career-decision making will improve;
- Students' intentions and goals will improve regarding career-decision making;
- Teachers will learn to infuse the career-linking model in their classroom;
- Teachers will be able to effectively implement the career-linking model in their classroom; and
- Teachers will share the career-linking model with parents.

### **c) Reasons why this program is needed**

For the past two decades, women and racial and ethnic minority group members have been the focus of intensive efforts to promote their entry into math and science careers. Intervention programs initially targeted college students, and then increasingly targeted younger students. Despite efforts to increase their numbers, women and minority group members continue to be underrepresented in technical, mathematics, and science-oriented education, and by extension in math and science careers. Successful intervention programs are characterized by their centrality to the mission of the institution (rather than by being an add-on program), by having faculty integrally involved in a program that links a school with a university, and by being primarily oriented to younger (i.e., elementary or middle school) children. Successful models also make an effort to incorporate culturally relevant material, have a variety of activities, make use of computers, and have high expectations of parental involvement (Fouad, 1997). The Oregon Department of Education standards call for an emphasis in middle school on the investigation of academic knowledge and technical skills needed for a variety occupational groups. Effective precollege programs with the potential to increase the number of underrepresented K-12 students progressing to STEM careers demonstrate common essential strategies. These include (1) promoting awareness of the STEM professions, (2) providing

academic enrichment, (3) working through competent and well-prepared instructors, and (4) being supported by the educational system of student participants. (Chubin, May, and Babco, 2005)

<b>d) Target Audience:</b>	<b>Grade Level(s)</b>	<b>Subject Areas</b>	<b>Recruitment Strategy</b>
<b>Teachers</b>	6, 7 and 8	Science and mathematics	Members of SMILE program <b>(already established)</b>
<b>Students</b>	260 students, >80% are ethnic minorities, all students will be from underrepresented rural schools	Science and mathematics	Students in SMILE schools
<b>Special needs/ under-represented populations</b>	Middle schools	Science and mathematics	SMILE schools

## 2) Evaluation, Assessment, and Dissemination

**a) Anticipated outcome measures and methods of measurement:** The outcome measures will include:

- The Fouad, et al, 1997, instrument (attached), Spanish and English versions will be used to collect baseline data for students;
- A study specific survey will be developed to assess teachers' dispositions and beliefs regarding the infusion of career linking;
- Site visit observations and interviews, to document ongoing successes and need for modifications.

**b) Evaluation resources:**

All evaluation activities will be conducted under the supervision of Dr. Enochs. All staff will be involved in data collection via site visits and electronic communication. Each site will be visited at least one time during each module. Additionally a website will be used for qualitative data collection, feedback, and information dissemination.

**d) Formative evaluations:**

Formative evaluation of this program will seek to monitor all activities in order to make mid-course corrections and document successful events. This will be done by way of structured and informal interviews, classroom observations, and anecdotal evidence such as documents, student work, and peer review of activities.

**e) Summative evaluations:**

In an effort to document success in attaining project outcome objectives, we will collect pre and post test data. The attached surveys will be used to assess gains in career confidence, career interest, career-decision making, intentions, and goals of participating students. Additionally, will utilize course grades of participating students to assess gains in science and mathematics knowledge. For teachers we will design a study specific instrument to assess their implementation of the career-linking model. We will conduct pre/post analysis and report the findings.

**f) Dissemination:**

Outcomes of this project will be disseminated in multiple ways:

- We will develop and present papers at Oregon conferences such as the Oregon Science Teachers Association, Oregon Council of Teachers of Mathematics, and other educational conferences at the state level;
- Present papers at the American Society for Engineering Education and relevant national organizations in mathematics, science, and career education;
- Provide professional development in Oregon on the career linking model through outreach programs in the Science and Mathematics Education Department and the SMILE program at OSU;
- Provide the model materials to interested individuals and groups involved in OPAS; and
- Publish descriptive as well research articles in publications within Oregon and nationally such as the American Society for Engineering Education conference paper(s) and Proceedings, Journal of Engineering Education, Advances in Engineering Education, ASEE International Action Newsletter, Computers and

The program staff will utilize the results of this program to follow up with a proposal to scale up the dissemination of the model in Oregon by further testing of the model in suburban and urban schools. Our goals in this effort will be to eventually have this model implemented as a part of the statewide curricula in mathematics and science for middle schools. We will seek additional funding from sources such as ODE math science partnership funds, the National Science Foundation, Carl Perkins career technical education funds, and other sources such as corporate and private foundations.

**3) Participating Organization(s)**

*a) Mission and history of responsible organization:*

Science and Mathematics Education Department: The Science and Mathematics Education Department, located in the College of science has 8 faculty and over 50 graduate students. The Department has been in existence since 1950. The primary mission of the Department is to prepare science and mathematics teachers. The teacher preparation program is a 5<sup>th</sup> year masters program and offers a Masters degree and licensure. The Department has over 20 full time PhD students. About one third of the students are study to be future teacher educators. The Department has a strong working relationship with all programs in the College of Science and the College of Engineering. The Faculty conducts educational outreach and conduct research in education, including engineering education.

*b) Collaborative partners:*

SMILE Program: This program is a partnership between OSU and 12 school districts across Oregon, provides weekly after-school club meetings with science, mathematics, and engineering activities and hosts college connection problem-solving events for minority, rural, and/or low-income students (83% of SMILE students are ethnic minorities, primarily Latino and Native American; 65% are female). Through annual professional development workshops (3 times a year) teachers practice new curricula, with sessions presented by partner scientists and science educators. Families of SMILE students engage in hands-on science activities during annual family science nights in each school district, and attend field trips. This partnership would directly support 260 SMILE students in 13 middle schools and 26 teachers. As all these teachers are also classroom teachers this project would additionally serve the students in each of those 26 classrooms.

**4) Schedule**

<b>Quarter</b>	<b>Activity</b>	<b>Major Milestones</b>	<b>Responsibility/ Dependency</b>
1	Develop Modules; Professional Develop Meeting	All modules developed; Teachers prepared to use modules	Larry Enochs Ryan Collay Sue Ellen De Chenne SueAnn Bottoms
2	Implement Career Linking modules	Site visit to each school for each module	SueAnn Bottoms Sue Ellen De Chenne
3	Implement Career Linking modules	Site visit to each school for each module	SueAnn Bottoms Sue Ellen De Chenne
4	Conduct summative evaluation, process data, and write report.	Analyze data, write report	Larry Enochs Sue Ellen DeChenne SueAnn Bottoms Ryan Collay

## Attachments

<b>Pre-College Proposal Budget</b> July 1, 2007 - June 30, 2008	
<b>Salary Expenses</b>	
Principle Investigator: Larry Enochs %FTE =0.15	13,129
Co-Principle Investigator: SueAnn Bottoms %FTE=0.10	4,924
Graduate Student: Sue Ellen DeChenne %FTE=0.49	19,835
Professional Develop Coordinator: Ryan Collay %FTE=0.20	9,062
<b>Other Payroll Expenses for above</b>	
Larry Enochs OPE	5,908
SueAnn Bottoms OPE	2,610
Sue Ellen DeChenne OPE, Health Supplement, Tuition	13,759
Ryan Collay OPE	5075
<b>Subtotal</b>	<b>74,302</b>
<b>Services &amp; Activities</b>	
Teacher workshops	
Participant support for travel, meals, lodging, materials	4,000
Travel (Evaluation staff)	4,000
<b>Subtotal</b>	<b>8,000</b>
<b>Supplies &amp; Equipment</b>	
Instructional: Real-world Engineering Connections including Career Linking Career Materials; Career Linking Modules and Kits; and Career Linking Modules	33,698
<b>Subtotal</b>	<b>33,698</b>
<b>Grand Total</b>	<b>\$116,000</b>

### 5) Budget Narrative d) Budget Justification

Project Personnel - We request 74,302 for personnel costs for this project. This amount will support the project PI at 0.15 FTE (19,037); the co-PI at 0.1 FTE (7,533); SMILE programming faculty at 0.25 FTE (14,137); and a Science and Math Education graduate student at 0.49 FTE (33,594)

Teachers Workshop – We request \$4,000 for participant support for travel, meals, and lodging for club advisors.  
Instructional Materials –

Staff Travel – We request \$4,000 to support travel costs for project staff to travel to each site for implementation and evaluation.

Curriculum Items We request **33,698** for materials, external speakers, local field trips including **10,098** for local field trips and expert teachers; 2,600 for career materials for local 13 clubs; and 21,000 for 70 career-linking modules, and 70 curriculum kits.

#### e) Citations

Chubin, Daryl E., May, Gary S., & Babco, Eleanor L. (2001). Diversifying the engineering workforce. *Journal of Engineering Education*, *94(1)*, 73-86

Fouad, N., Smith, P. & Enochs, L. (1997). Reliability and validity evidence for the middle school self-efficacy scale. *Measurement and Evaluation in Counseling and Development*, April 1997, V. 30.

Fouad, N. (1995). Career linking: An intervention to math and science career awareness. *Journal of Counseling & Development*. 73 (5).

#### Biographical Statements

**Larry G Enochs, Professor, Science and Mathematics Education Department (SMED), College of Science, Oregon State University.** Dr. Enochs received his BS from Indiana University, MS from the University of Rochester, and EdD from Indiana University. He has held faculty positions at Kansas State University, the University of Wisconsin-Milwaukee, and the National Science Foundation. Additionally, Dr. Enochs taught Middle School Earth Science for 12 years in Columbus, Indiana. Presently he directs the PhD program in SMED. His research interests include the study of student and teacher beliefs about their ability to learn science. In particular he has developed numerous instruments used throughout the world to study these beliefs. He also has conducted several research projects and grant efforts dealing with rural schools. Dr. Enochs has directed Science Education research centers at KSU and UWM. During his time at NSF he was responsible for projects in earth science education and science education research projects. Dr. Enochs has published over 40 research articles, edited 3 international journals, and taught science education for over 25 years.

**SueAnn I. Bottoms, Associate Director, The Science and Math Investigative Learning Experiences (SMILE) Program, College of Education, Oregon State University.** Dr. Bottoms received her PhD in Science Education from OSU. She designs, coordinates, and evaluates the professional development for The SMILE Program based on current research on effective professional development for teachers of science and mathematics. Her research interests include retention and renewal of rural teachers, community of practice as a model for professional development, and the role of school-university partnerships in supporting rural teachers. As a Science Leader for the Oregon Department of Education she presents statewide workshops for teachers on scientific inquiry and implementation of standards in the classroom. She has recently made presentations at conferences or workshops sponsored by NSTA, OSTA, Oregon Academy of Sciences, OHSU, National Conference on Race and Ethnicity in Higher Education, Outreach and Engagement, Society for the Advancement of Chicanos and Native Americans in Science and NW Regional Education Laboratory. She has a BS in Biology, an MS in Science Education. Dr. Bottoms taught K-14 science, and has been involved in science education for 25 years.

**Ryan Collay, Programming and Evaluation Coordinator,** oversees activities of SMILE's programs, including college connection special events for SMILE students. He develops curricula for use in teacher workshops and clubs, helps scientists to develop presentations for teachers, and facilitates the efforts of programs coordinators. His research interest is in creating educational experiences that support student's aspirations and interests in science, technology, engineering, and mathematics and higher education. Collay holds a BS in Biology and an interdisciplinary MA. He has taught science at elementary and middle school and has over 25 years experience in science education.

**Sue Ellen DeChenne, Doctoral Student, Science and Mathematics Education Department (SMED), College of Science, Oregon State University (OSU)** Ms. DeChenne received her BS in Microbiology (1988) and MS in Genetics and Cell Biology (1991) from Washington State University (WSU). After finishing her BS, she held active research positions for nine years with laboratories at WSU in various departments including Biochemistry, Genetics and Cell Biology, Institute of Biological Chemistry, and Veterinary Microbiology and Pathology. During this time she co-authored five research papers. For the following nine years, she taught Research Techniques in Molecular Biology for the School of Molecular Biosciences at WSU. These courses were held at both the graduate and senior

undergraduate levels. Presently she is finishing her first year of doctoral coursework in science education. Her research interests include the retention and recruitment of women into science, mathematics, and engineering; feminist science pedagogy; and large classroom instruction.

#### **f) Example Materials and Products**

### **Career Linking, an Intensive Career Awareness Model (Fouad, 1997)**

The intervention used was a yearlong project designed to infuse math and science career awareness into math and science curricula as well as other subjects. Math, English, social studies, and science teachers worked together and with the school counselor, a graduate student in counseling, and university faculty.

A 6-week unit on a career field was developed and repeated throughout the year with various fields. Before the initiation of the career units, a number of activities were developed to introduce students to the program and to help them to identify with it. The first was a logo contest. Because this project was in partnership with the University of Wisconsin-Milwaukee, students were asked to draw a logo that would show the university and middle school coming together, linked with careers. Buttons and posters were made from the winning logo, which was also displayed at parent conferences in the fall. Early identification with career linking was strongly encouraged and fostered by the school's teachers. Additionally, there was a field trip to the university, where students were given a brief presentation by staff from the precollege program, a tour of campus, and then a special presentation by a professor of physics titled "Science Can be Fun."

Following introductory activities, a series of units were planned around specific career fields. This helped planners to organize for the future and assisted teachers in the curricular areas to better coordinate their activities. All of the activities were interdisciplinary in nature. The career units that were eventually developed were health occupations, natural sciences, engineering, robotics, and service occupations. Each unit proceeded in the following way:

#### **Week 1: Introduction**

The first week was devoted to preparing students and introducing them to the specific career fields (e.g., engineering). General classroom discussions were supplemented with the creation of bulletin boards, development of vocabulary used in the career, audiovisual presentations and readings about the career field. During this time planners brainstormed about possible connections with cooperating businesspersons who knew someone or some organization that could provide information about engineering. Schedules were set and communication with parents was planned.

#### **Week 2: Large Group Field Trip**

Learning about the career field was followed by a field trip with the students. This was planned and organized with a local business contact. In some locations, several tour guides were provided and all students had the same trip. In other locations, students chose three of six minitours. After-activity assignments were developed, and thank-you notes were sent to all cooperating employees. Parents were invited to participate as chaperones, and several parents cooperated.

#### **Weeks 3 and 4: Speakers**

On the basis of the introduction and the field trip, students gave feedback on the specific career areas in which they were interested. Speakers were contacted, again using a brainstorming method on contacting cooperating businesses. A survey was developed, and students were asked to choose two career areas that they would like to attend on Speakers Day. Eight speakers were scheduled on the same day. Each presentation, 30 to 40 minutes in length, was given twice. Students were prepared with questions to ask each speaker. Preparation included teaching students how

to ask questions and a discussion of appropriate behavior. After the sessions, students discussed the information they gained and wrote thank-you notes to the speakers.

### **Week 5: Shadowing**

Students who continued to show interest in specific career areas were given the opportunity to shadow an employee for a half day. Students who were chosen were introduced to the concept of shadowing and the appropriate behavior expected of them during the shadowing assignment. Faculty contacted businesses for help in securing shadowing placements for students and made all other necessary arrangements. Each student was given a folder that included a research form to help the student learn more about the specific career and a follow-up form in which the student evaluated his or her visit.

### **Week 6: Closure**

Students and teachers spent the last week of the unit evaluating it. This was done through an evaluative exercise for students, either a paper or a brief test, as well as classroom discussions. Faculty also evaluated the speakers, field trip, and shadowing exercises to determine who would be asked to return and which activities would be continued.

Fouad, Nadya A. (1995). *Career linking: An intervention to promote math and science career awareness*. *Journal of Counseling & Development*, 73 (5), p527.

g)Letters of Support



**Science and Mathematics Education**

Oregon State University, 239 Weniger Hall, Corvallis, Oregon 97331-6508

T 541-737-4031 | F 541-737-1817 | [www.oregonstate.edu/dept/sci\\_mth\\_education](http://www.oregonstate.edu/dept/sci_mth_education) | [larry.flick@oregonstate.edu](mailto:larry.flick@oregonstate.edu)

Michele Vitali  
Engineering and Technology Council

Dear Michele;

It is a pleasure to write in support Dr. Larry Enochs' proposal entitled Career-Linking in Rural Middle Schools. Larry has an excellent track record in conducting the type of work required in this effort. He directed numerous NSF and other projects. His work on the Career-Linking model began when he was at the University of Wisconsin-Milwaukee.

I am familiar with the model a have and consider it a well documented model for enhancing student career awareness. My NSF project utilized career-linking to improve construction-technology student understanding of the value of science and mathematics to future career choices. An outcome of this work was that students were better able to articulate specific examples of science and mathematics that apply to the fields of construction.

Lastly, I can assure that Larry's work in establishing methods of instrument development and analysis is internationally well known. His own motivation and career education background is outstanding. Another area of Larry's background is his work in the area of rural science and math education. His knowledge of the rural context in learning is outstanding.

This project will have value to advancing our ability to offer more meaningful connections between career and science education to a broad range of students.

Sincerely,

Lawrence B. Flick, PhD  
Professor and Chair



**The SMILE Program**

Oregon State University, 18 Gladys Valley Center, Corvallis, Oregon 97331-3510  
T 541-737-2388 | F 541-737-3554 | <http://smile.oregonstate.edu>

May 25, 2007

Dr. Larry Enochs, Professor  
Department of Science and Mathematics Education  
Oregon State University  
233 Weniger Hall  
Corvallis, OR 97331

Dear Larry:

This letter confirms the commitment of The Science and Math Investigative Learning Experiences (SMILE) Program to serve as a partner on your proposed project *Career-Linking in Rural Middle Schools*. The project's key goals offer a strong complement to SMILE's current work at the middle school level. The need for greater participation and diversity in science, technology, engineering, and mathematics (STEM) careers is quite clear. Helping students to increase their understanding of various STEM careers and to build their confidence, capacity, and motivation to pursue those careers is an effort that requires the involvement of many. We welcome this opportunity to partner with you to expand the base of partners working to bring about positive change for some of Oregon's educationally underserved youth.

SMILE is a university-school-community partnership engaging OSU with fifteen communities and twelve school districts to provide academic enrichment and college readiness in science and mathematics for underrepresented and underserved students in grades 4-12. The purpose of the program is to increase the number of underrepresented and educationally underserved students who graduate high school qualified to go on to higher education interested in careers in math, science, engineering, health professions, and teaching. More than 75% of SMILE students graduate high school, and 80% or more of these graduates enroll in higher education.

Currently, The SMILE Program provides enrichment for 750 students and support for 65 teachers in 35 afterschool clubs. The students meet once a week for meaningful engagement in science and math through the facilitation of classroom teachers, serving as SMILE Club advisors. The clubs take two to four field trips per year. Additionally, the students at each level attend a problem-solving college-connection event on a college campus or educational facility and gain familiarity with higher education while participating in a challenging academic experience. The teachers receive support through a series of professional development workshops at OSU and various regional locations.

The work of The SMILE Program is nationally recognized. In 1999, SMILE was one of five recipients of the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring. This recognition brought validation for eleven years of effective work in inspiring wondering minds and encouraging the academic success and college readiness of SMILE participants.

If the proposed project is funded, The SMILE Program agrees to participate as test site for the adaptation of existing career-linking modules to a rural setting through afterschool SMILE Clubs. Specifically, SMILE will work with you and other project partners to:

- Adapt one or two of the career-linking classroom modules to the afterschool setting;

- Provide professional development sessions for middle school SMILE Club advisors to work through the activities of each module and plan for their implementation in the clubs;
- Support club advisors in implementing adapted career-linking modules in thirteen middle school clubs;
- Develop materials about related careers to be shared with families during Family Math and Science Night and through other venues; and
- Participate in site visits to support the project's implementation and evaluation activities.

I hope The SMILE Program is privileged to work with you on this project and bring additional resources and learning opportunities to the students and communities we serve.

Sincerely,

Eda Davis-Butts, Director  
The SMILE Program

## **h) Instruments**

### **PART I**

#### **CAREER DECISION MAKING (SE)**

\*\*\*\*\*  
Please Indicate the degree to which you agree or disagree that you could do each statement below by circling the appropriate letters to the right of each statement.

SA = Strongly Agree  
A = Agree  
UN = Uncertain  
D = Disagree  
SD = Strongly Disagree  
\*\*\*\*\*

- |     |  |    |   |    |   |    |
|-----|--|----|---|----|---|----|
| 1.  | Find information in the library about five occupations I am interested in.                                     | SA | A | UN | D | SD |
| 2.  | Make a plan of my educational goals for the next three years.  | SA | A | UN | D | SD |
| 3.  | Select one occupation from a list of possible occupations I am considering.                                    | SA | A | UN | D | SD |
| 4.  | Determine what occupation would be best for me.  | SA | A | UN | D | SD |
| 5.  | Decide what I value most in an occupation.   | SA | A | UN | D | SD |
| 6.  | Resist attempts of parents or friends to push me into a career I believe is beyond my abilities or not for me. | SA | A | UN | D | SD |
| 7.  | Describe the job skills of a career I might like to enter.   | SA | A | UN | D | SD |
| 8.  | Choose a career in which most workers are the opposite sex.  | SA | A | UN | D | SD |
| 9.  | Choose a career that will fit my interests.  | SA | A | UN | D | SD |
| 10. | Decide what kind of schooling I will need to achieve my career goal.   | SA | A | UN | D | SD |
| 11. | Find out the average salary of people in an occupation.  | SA | A | UN | D | SD |
| 12. | Talk with a person already employed in a   | SA | A | UN | D | SD |

field I am interested in

**CAREER DECISION MAKING (OE & I/G)**

\*\*\*\*\*

Please Indicate the degree to which you agree or disagree with each statement below by circling the appropriate letters to the right of each statement.

SA = Strongly Agree  
A = Agree  
UN = Uncertain  
D = Disagree  
SD = Strongly Disagree

\*\*\*\*\*

- |     |   |    |   |    |   |    |
|-----|---|----|---|----|---|----|
| 1.  | If I learn more about different careers, I will make a better career decision.                                      | SA | A | UN | D | SD |
| 2.  | If I know my interests and abilities, then I will be able to choose a good career for me.                           | SA | A | UN | D | SD |
| 3.  | If I make a good career decision, then my parents will approve of me.   | SA | A | UN | D | SD |
| 4.  | If I know about the education I need for different careers, I will make a better career decision.                   | SA | A | UN | D | SD |
| 5.  | If I spend enough time gathering information about careers, I can learn what I need to know when I make a decision. | SA | A | UN | D | SD |
| 6.  | I intend to spend more time learning about careers than I have been.  | SA | A | UN | D | SD |
| 7.  | I plan to talk to lots of people about careers.   | SA | A | UN | D | SD |
| 8.  | I am determined to talk to my teachers about career opportunities.  | SA | A | UN | D | SD |
| 9.  | I am committed to learning more about my abilities and interests.   | SA | A | UN | D | SD |
| 10. | I intend to get all the education I need for my career choice.  | SA | A | UN | D | SD |
| 11. | I intend to be a 1) _____<br>If not that 2) _____<br>If not that 3) _____   |    |   |    |   |    |

**PART II**

**MATHEMATICS & SCIENCE (SE)**

\*\*\*\*\*

Indicate your ability to do each of the following statements below by circling the appropriate numbers to the right of each statement.

- 1 = Very High Ability
- 2 = High Ability
- 3 = Uncertain
- 4 = Low Ability
- 5 = Very Low Ability

\*\*\*\*\*

- |     |  |   |   |   |   |   |
|-----|--|---|---|---|---|---|
| 1.  | Earn an A in math.   | 1 | 2 | 3 | 4 | 5 |
| 2.  | Earn an A in science.  | 1 | 2 | 3 | 4 | 5 |
| 3.  | Get an A in math in high school.   | 1 | 2 | 3 | 4 | 5 |
| 4.  | Get an A in science in high school.  | 1 | 2 | 3 | 4 | 5 |
| 5.  | Determine the amount of sales tax on clothes I want to buy.                              | 1 | 2 | 3 | 4 | 5 |
| 6.  | Collect dues and determine how much to spend for a school club.                          | 1 | 2 | 3 | 4 | 5 |
| 7.  | Figure out how long it will take to travel from Milwaukee to Madison, driving at 55 mph. | 1 | 2 | 3 | 4 | 5 |
| 8.  | Design and describe a science experiment that I want to do.                              | 1 | 2 | 3 | 4 | 5 |
| 9.  | Classify animals that I observe.   | 1 | 2 | 3 | 4 | 5 |
| 10. | Predict the weather from weather maps.   | 1 | 2 | 3 | 4 | 5 |
| 11. | Construct and interpret a graph of rainfall amounts by state.                            | 1 | 2 | 3 | 4 | 5 |
| 12. | Develop a hypothesis about why kids watch a particular TV show.                          | 1 | 2 | 3 | 4 | 5 |

**MATHEMATICS & SCIENCE (OE&I/G)**

\*\*\*\*\*

Please Indicate the degree to which you agree or disagree with each statement below by circling the appropriate letters to the right of each statement.

SA = Strongly Agree  
 A = Agree  
 UN = Uncertain  
 D = Disagree  
 SD = Strongly Disagree

\*\*\*\*\*

- |     |   |              |
|-----|---|--------------|
| 1.  | If I take a lot of math courses, then I will be better able to achieve my future goals. | SA A UN D SD |
| 2.  | If I learn math well, then I will be able to do lots of different types of careers.     | SA A UN D SD |
| 3.  | If I take a math course, then I will increase my grade point average.                   | SA A UN D SD |
| 4.  | If I do well in science classes in middle school, then I will do well in high school.   | SA A UN D SD |
| 5.  | If I get good grades in math, then my parents will be pleased.                          | SA A UN D SD |
| 6.  | If I get good grades in math and science, my friends will approve of me.                | SA A UN D SD |
| 7.  | If I do well in science, then I will be better prepared to go to college.               | SA A UN D SD |
| 8.  | I plan to take math classes in high school.   | SA A UN D SD |
| 9.  | I intend to take science classes in high school.  | SA A UN D SD |
| 10. | I am committed to study hard in my science classes.                                     | SA A UN D SD |
| 11. | I intend to enter a career that will use math.  | SA A UN D SD |
| 12. | I am determined to use my science knowledge in my future career.                        | SA A UN D SD |
| 13. | I intend to enter a career that will use science.                                       | SA A UN D SD |
| 14. | The career my parents want for me is_____   |              |
| 15. | The career my teachers think I should enter is_____                                     |              |

## MATHEMATICS & SCIENCE (INT)

\*\*\*\*\*

Please Indicate the degree to which you like or dislike the activity in each statement below by circling the appropriate letters to the right of each statement.

L = Like  
NS = Not Sure  
DS = Dislike

\*\*\*\*\*

- |     |  |   |    |    |
|-----|--|---|----|----|
| 1.  | Visiting a science museum.             | L | NS | DS |
| 2.  | Listening to a famous scientist talk.  | L | NS | DS |
| 3.  | Solving computer problems.             | L | NS | DS |
| 4.  | Solving math puzzles.                  | L | NS | DS |
| 5.  | Touring a science lab.                 | L | NS | DS |
| 6.  | Joining a science club.                | L | NS | DS |
| 7.  | Reading about science discoveries.     | L | NS | DS |
| 8.  | Participating in a science fair.       | L | NS | DS |
| 9.  | Working in a science laboratory.       | L | NS | DS |
| 10. | Learning about energy and electricity. | L | NS | DS |
| 11. | Creating new technology.               | L | NS | DS |
| 12. | Using a calculator.                    | L | NS | DS |
| 13. | Working with plants and animals        | L | NS | DS |
| 14. | Working as an astronomer               | L | NS | DS |
| 15. | Taking classes in science.             | L | NS | DS |
| 16. | Taking math classes.                   | L | NS | DS |
| 17. | Working in a medical lab.              | L | NS | DS |
| 18. | Working with a chemistry set.          | L | NS | DS |
| 19. | Inventing                              | L | NS | DS |
| 20. | Watching science program on TV.        | L | NS | DS |

Demographics

FEMALE \_\_\_ MALE \_\_\_

AGE: \_\_\_\_\_

RACE: (circle one) White, Hispanic, Black, Asian, Native American, other.

Do you plan to go on with your schooling after high school? (circle one) yes no

Please respond to the following questions by placing an X in the appropriate blank. Only select **ONE** answer for each item.

1. Please rate how you think you will do in a class that requires computers to be used.
  - \_\_\_ a. Superior--One of the Most Outstanding students in the class;
  - \_\_\_ b. Above Average;
  - \_\_\_ c. Average--A Typical student in the class;
  - \_\_\_ d. Below Average; or
  - \_\_\_ e. Low--One of the Least Outstanding students in the class.
2. If you have your choice, will you choose to take a math class?
  - \_\_\_ a. Definitely No
  - \_\_\_ b. Probably No
  - \_\_\_ c. Not Sure
  - \_\_\_ d. Probably Yes
  - \_\_\_ e. Definitely Yes
3. Describe your interest in science.
  - \_\_\_ Very High Interest
  - \_\_\_ High Interest
  - \_\_\_ Average Interest
  - \_\_\_ Low Interest
  - \_\_\_ Very Low Interest
4. If you have your choice, will you choose to take a science class?
  - \_\_\_ a. Definitely No
  - \_\_\_ b. Probably No
  - \_\_\_ c. Not Sure
  - \_\_\_ d. Probably Yes
  - \_\_\_ e. Definitely Yes
5. Do you think science is more for girls or more for boys?
  - \_\_\_ More for girls
  - \_\_\_ Slightly more for girls
  - \_\_\_ About the same
  - \_\_\_ Slightly more for boys
  - \_\_\_ More for boys
6. Do you think math is more for girls or more for boys?
  - \_\_\_ More for girls
  - \_\_\_ Slightly more for girls
  - \_\_\_ About the same
  - \_\_\_ Slightly more for boys
  - \_\_\_ More for boys
7. Describe your interest in mathematics.
  - \_\_\_ Very High Interest
  - \_\_\_ High Interest
  - \_\_\_ Average Interest
  - \_\_\_ Low Interest
  - \_\_\_ Very Low Interest

8. Describe your interest in learning more about careers.

\_\_\_\_\_ Very High Interest

\_\_\_\_\_ High Interest

\_\_\_\_\_ Average Interest

\_\_\_\_\_ Low Interest

\_\_\_\_\_ Very Low Interest