Sharing Our Successes II

Changing the Face of Science and Mathematics Education Through Teacher-Focused Partnerships

A National Conference of
Scientific Work Experience Programs
for K-12 Teachers

October 13 - 14, 1994
Lawrence Hall of Science, University of California at Berkeley

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SHARING OUR SUCCESSES II

CONFERENCE PROCEEDINGS

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Introduction

Industry Initiatives for Science and Math Education (IISME) in the San Francisco Bay Area planned and convened the second national conference for representatives of scientific work experience programs for K-12 teachers (SWEPs) at Lawrence Hall of Science, University of California at Berkeley October 13-14, 1994. The goal of this conference was to further strengthen the growing community of SWEP managers and teacher participants by providing an opportunity for sharing expertise and strategies about the following:

1) How SWEPs can complement and stimulate systemic education reform efforts
2) Assessment strategies piloted by the ambitious multi-site evaluation project funded by the U.S. Department of Energy (DOE) as well as smaller evaluation projects piloted by other SWEPs
3) Expanding and strengthening the base of teachers served by SWEPs
4) Ensuring that SWEPs adequately support teachers in affecting classroom transfer and offer "more than just a summer job"
5) Sustaining and expanding new programs

A special teacher strand focused on leadership development, supporting teachers to become effective change agents in their classrooms and schools, and developing strong teacher communities.

Conference Sponsors

The Sharing Our Successes II Conference was sponsored and funded by the AT&T Foundation, Intel Foundation, Lawrence Hall of Science, NASA, National Science Foundation, Research Corporation, Triangle Coalition for Science and Technology Education, and the U.S. Department of Energy. In-kind donations were made by Anchor Brewing Company, J. Lohr Winery, Market 1, Moshin Vineyards, Pepsi-Cola Corporation, Pete's Brewing Company, Safeway Stores, Sobon Estate Winery, and TRW.

Participant Profile

One hundred thirty-six people attended the conference. They represented 48 of the 91 identified scientific work experience programs and ten other community-education partnerships. Programs from 28 states, Australia, and Canada were represented.

Sixty-eight of the participants (50%) were teachers, including 42 high school, 16 elementary, and 8 middle/junior high teachers. Fifty-four of the attendees (40%) were SWEP program coordinators or managers and were nearly evenly divided among managers of industry-based SWEPs, university-based SWEPs, and the DOE TRAC Program. Fourteen participants (10%) were involved in other roles within industry-education partnerships, universities, mathematics/ science alliances, regional science centers, etc.

Conference Sessions

Operating under the firm belief that practitioners and teachers involved with SWEPs are the "experts in the field," IISME invited participants themselves to facilitate, present, and record most of the sessions offered. Fifty-seven participants (including 32 teachers) made a formal presentation, facilitated a roundtable session, or shared a classroom transfer project. Notes from most sessions were recorded by participants and are included in these proceedings.

In addition, speakers not directly associated with a local SWEP included Professors Milbrey McLaughlin and Joan Talbert of Stanford University's Center for Research on the Context of Teaching, Dr. Susan Loucks-Horsley and Dr. Jean Young of the National Center for Improving Science Education, and Van Schoales of the Bay Area Coalition of Essential Schools.

Interpretations and representations of session content are those of the session recorder and not IISME. Notes have not been checked for accuracy by session facilitators/presenters.

Plenary Session: Teachers Modeling Success

Presenters: Deborah Mears, Partners for Terrific Science, Middletown, OH
Sandra Van Natta, Partners for Terrific Science, White Oak Middle School, Cincinnati, OH
Judy Young, IISME San Francisco Bay Area, College Park High School, Pleasant Hill, CA

Recorder: Dale Beames, TRAC-Idaho National Engineering Laboratory, Coral Springs High School, Coral Springs, FL

As an intern for Procter and Gamble, Ms. Mears developed a process to store saliva. From her experience she wanted students to do what scientists do: to search for answers, thirst for knowledge, give and receive constructive criticism, and write about science. One particular example lesson incorporating these skills is the Tower Lab, in which students are given minimal materials and challenged to build the tallest tower possible. The project encourages communication skills, teamwork, planning, and derring-do.

Ms. Van Natta performed high pressure liquid chromatography in her first research experience with Proctor and Gamble. She mentioned that at first she was intimidated by the task of working in industry, but soon she readily adapted. As a result of her experience in industry she decided she wanted to integrate into her classes some of the skills she saw at work in the industrial world, namely increased problem-solving and increased group work.

These concepts materialized in the form of development/marketing/sales programs in Ms. Van Natta's school. Among the products developed and sold were Slime, Stress Balls, Friendly Plastic, Super Slurper, "Gold" Pennies, Magic Crystal Trees, Eggshell Geodes, and Cartesian Divers. The students enjoyed these projects greatly and the response by consumers was great; for one project they had over 12,000 orders.

Ms. Young teaches high school math and has served as IISME peer coach for the past two years. Some of the benefits she has derived from her IISME experience include increased self-esteem, greater knowledge of what skills industry wants students to possess, the ability to describe with authenticity what current industry and technology research involves, and a wealth of career knowledge which allows her to better advise students. Interestingly, Ms. Young found, as do most SWEP teachers, that the grass was not greener for her on the other side of the industry fence.

Her IISME experience has shown her that industries want cooperative problem solving, that education and training never stop, and that the ability to find information and perform research is more important than the knowledge of facts. In addition, teachers can help kids develop the managerial skills she observed in industry. In her curriculum she includes projects which teach people skills, group dynamics, leadership development, time management, and motivational skills.

The common thread that tied the session together was the observation by the three teachers that industry demands group work, communications skills, critical thinking, and sharp problem solving skills from employees. Any activity which cultivates these skills while students are in school prepares them for an ever more competitive and technological work place.

Plenary Session: Building Teacher Communities

Presenters: Dr. Milbrey McLaughlin and Dr. Joan Talbert, Center for Research on the Context of Secondary School Teaching, Stanford University, Stanford, CA

Recorder: Cecilia Warshaw, Semiconductor Research Corporation, Research Triangle Park, NC

Since 1987 Drs. McLaughlin and Talbert have been working on a national research project to assess factors which either constrain or enable the best work of teachers and their students. They are doing longitudinal, intensive case studies to identify and describe the salient factors and how those factors impact teaching.

The study involves 900 teachers located in 16 schools, public and private, in seven districts across two states. The schools represent a diversity of settings, with the exception of troubled inner city or very rural schools. The study is

looking at the impact of differences in policy and practices at the state, district, community, school, and department levels.

Dr. McLaughlin described the teaching/learning context as a triangle defined by the teacher, students, and the subject content. American schools once were quite successful. What changed?

Teachers, including their experiences as students and their professional training, have changed little. The content has remained basically the same, though the volume in some subjects has increased. The component of the triangle most significantly changed is students: the nature of their families, mobility of their society, competition for their attention, and their preparedness level to succeed in a global economy.

What factors enabled some teachers to make successful adaptations in their pedagogy and content to maintain student learning levels? The major difference was the professional community. Teachers who merely continued existing practices taught in teaching communities characterized by norms of privacy, routine practices, bureaucracy, low student expectations, and static subject areas. The teachers continued these practices even though they acknowledged that fewer and fewer of their students were succeeding.

Teachers in teaching communities characterized by collegiality, innovation, support for teacher learning, commitment to teaching students, and dynamic subject areas generally made changes which enabled more of their students to be successful. The most important elements were a strong commitment to student learning and a dynamic subject matter. The teachers were more reflective about their teaching and shared openly with colleagues. Practices and policies were challenged; counterproductive ones were modified or eliminated.

The professional community can differ widely within the same school system or even within the same school. Some schools had principals who personified instructional leaders and created an environment for teachers to act as change agents. In schools which lacked a common vision, differences sprouted among departments. Some departments were organized around "this is my department" mentalities, while others were composed mostly of teachers with a strong technical culture, shared goals, and a strong commitment to provide opportunities for their students. Drs. McLaughlin and Talbert concluded that "norms" of the teaching community make a difference in what teachers are able to do -- in what policies become institutionalized.

Dr. Talbert presented work to date on how active professional learners help build a pro-active teaching community when they return to the school setting. She profiled two schools with similar student populations within the same district. Pairs of science and math departments in each school were also examined. Members of math department "x" held a static concept of mathematics, and that seemed to impact their view of students. Every course had a readiness test; the percentage of students who must retake readiness tests continues to increase. Under-prepared teachers taught only "low track" math courses; only one teacher taught calculus.

Math department "y" existed in a school which was interested in actively constructing the subject around the student. While members of this department were typical of California math teachers (approximately 50 percent without a BA or BS in mathematics), these teachers all developed the ability to teach calculus.

In one school, the personnel were eager to talk. They were very collegial but their collegiality did not yet extend to teaching issues. What types of projects would bring them together? Another school setting was very static; even some of the teachers referred to themselves as "dinosaurs." A consultant was brought in to promote change. The question became how to introduce new ideas and engage colleagues without causing alienation or schisms.

One answer was mutual trust. Teachers who have done things the same way for a long time have much wisdom and experience to share; they should be respected and learned from. Also, entrepreneur teachers should be supported. They serve as catalysts to develop new practices and policies which address continuing or worsening problems. Together the schools can enable more students to be successful.

Recommendations

1) This study became the topic of many informal discussions during the conference. Its relevance to SWEPs and to reform efforts was recognized. SWEP program personnel and participants need to stay abreast of results from this study. Updates or briefings should be placed in the *Network For Success* newsletter.

2) Most SWEP participants are entrepreneur teachers; their local school community may not be supportive of their efforts. The participants need to be connected for mutual support via a newsletter and/or telecommunications connection.

(Editor's note: Readers may wish to order a report entitled *Contexts That Matter For Teaching and Learning* which describes McLaughlin and Talbert's work in more detail. To order, send $3.75 check payable to Stanford University to Julie Cummer, Teacher Context Center, CERAS Building, Room 402, Stanford, CA 94305-3084.)

Plenary Session: SWEP Power for Year 2000

Presenter: Deborah Grossman, IISME San Francisco Bay Area, DuPont Photomasks, Santa Clara, CA

Recorder: Anna Crabtree, Research Corporation Partners in Science, Shawnee Mission South High School, Shawnee Mission, KS

IISME began its pilot program with 41 San Francisco Bay Area teachers in 1985. At present, almost 25 percent of Bay Area high school math, science, and computer science teachers (about 450) have been awarded fellowships, with some 750,000 students influenced by IISME ideas. In 1993 the Department of Energy recognized IISME as an exemplary *America 2000* program. In 1989 the Hearst Foundation, DOE, NASA, the National Science Foundation, and the Triangle Coalition chartered IISME replication nationwide.

Currently, IISME coordinates the network of Scientific Work Experience Programs (SWEPs) for teachers. IISME provided start-up assistance to 25 sister programs, and promotes dissemination of IISME strategies and program design in the United States and abroad. There are 91 active SWEPs in the U.S. In 1993, 1,500 teachers participated in SWEPs nationwide. These SWEPs were sponsored by 450 businesses, 180 universities and seven government agencies. Programs are in 40 states plus Washington D.C., and it is estimated that 1.1 million students are reached annually by SWEP teachers. The goal is to reach 20 million students in the next decade.

Questions
How did you manage to continue with recession in California?

A retreat involving all staff was organized and we brainstormed. Each board member was challenged to contact four or five potential host industries. We redefined our mission and a business plan was developed. Many of the summer programs are academically driven -- IISME is industry driven. A diverse company base sponsoring the program was one solution. Finding champions within each company is another answer.

Who makes up your board?

The board is comprised of 20 members of diverse backgrounds. Many are industry representatives, including research lab directors, administrators, finance and marketing managers. Superintendents and teachers also serve on the board. Each board member has a job description with clear expectations delineated.

Plenary Session: The State of the SWEP Network--Where Do We Go From Here?

Facilitator: Lauren Williams, The Triangle Coalition for Science and Technology Education, College Park, MD

See conclusions and recommendations on page 29 of this report.

Program Coordinator Workshop: Department of Energy (DOE) Program Evaluation

Presenters: Dr. Susan Loucks-Horsley, The National Center for Improving Science Education, Andover, MA
Eileen Engel, TRAC Program-Lawrence Berkeley Laboratory, Berkeley, CA

Recorders: Dr. Barbara Huntington, McNair Scholars Program, San Diego State University, San Diego, CA
Dr. Paul Markovits, Mathematics and Science Education Center, University of Missouri, St. Louis, MO

Dr. Loucks-Horsley introduced herself as the researcher/assessment developer partner of this workshop presentation and Ms. Engel as the recipient/participant of the assessment process for the DOE Teacher Research Associates Program (TRAC). TRAC Program Coordinators in the participant group included Royace Aiken, David Gibson, Terry Lashley and John Ortman.

Dr. Loucks-Horsley presented the process of "profiling," one aspect of an extensive assessment of the DOE TRAC Programs. Profiling is a component of the complete assessment process which enables the researcher to describe what is actually happening in a program, to identify elements for improvement, and to compare a program's design and operations to elements of "best practice". The researcher works through a process which provides for: the review of pertinent materials related to the program, interviews with program managers and staff, interviews with a sample of participants, mentors and other associated participants, and sample observations of the program in action and/or observations of teacher participants in their classrooms.

Dr. Loucks-Horsley and her team developed a "template" to assist researchers in assessing programs and also as a means to help program developers design and monitor programs. A completed template addresses specific questions and focuses the designers' vision so that previous research and practice can be used to appraise what "best practice" is known for types of programs being developed. The template enables the researcher or program manager to determine whether the program is designed to reflect what is most effective practice and to assess to what extent a program which is in place reflects "best practice".

Although this workshop focused on the DOE TRAC Program, the assessment process may be used in a number of different sociological and educational settings. It is intended for reviewing teacher research programs, teacher professional development programs, systemic reform programs and technical education programs.

The DOE TRAC Program is delineated into components for which best practice is determined. Seven components of effective (best) practice are part of the DOE TRAC Program assessment. These are:
1) Program Administration
2) Teacher Assignments
3) Preparation
4) The Teacher's Research Experience
5) Broader Lab-Related Experiences
6) Follow-up
7) Program Assessment

The workshop participants, 48 coordinators from various scientific work experience programs across the country, were given an opportunity to "carousel" brainstorm what specific practices should be within each of the seven components above as they address the quality of SWEP programs. A transcript of the carousel activity is included as Appendix C. These best practices were broad and encompassing and may be a significant help to program planners.

Unanswered Questions/Unresolved Issues
"Best practice" is determined by expert consensus, research literature findings, and descriptive data from similar programs. According to Dr. Loucks-Horsley, there is very little research on SWEP-type programs. The article by Dr. Sandra Gottfried, et. al. entitled "Scientific Work Experience Programs for Science Teachers: A Focus on Research-Related Internships" in the *1993 AETS Yearbook - Excellence in Educating Teachers in Science*, edited by P. Rubba, L. Campbell and T. Dana, ERIC Clearinghouse for Science, Mathematics and Environmental Education, The Ohio State University, Columbus, Ohio. 1993 is the only published piece known to date. Dr. Loucks-Horsley asked that reference citations for any other research which she may not be aware of be forwarded to her.

One factor which surfaced in the workshop was that only benefits to the teachers and benefits to students seem to be addressed in the assessment process. It was suggested that benefits to DOE, other than a probable literate workforce, should also be considered in the assessment.

The National Center for Improving Science Education, a division of The NETWORK, Inc., sells a series of publications which define profiling and provide templates for different programs. An order form is included as Appendix D. Dr. David Gibson stated that he would make available to Conference participants (upon request) a listing of the national TRAC members. Dr. Gibson's address is in the participant list.

Program Coordinator's Workshop: Department of Energy (DOE) Report on Student Outcomes

Presenter: Dr. Jean Young, National Center for Improving Science Education, Andover, MA

Recorder: David Tanis, Teachers in Industry Strategy, Grand Valley State University, Grand Rapids, MI

Dr. Young described three aspects of the National Center's work:
1) Profiling: looking at programs to determine the best practices
2) Student Evaluation: determining what happens to students when programs are delivered in classrooms
3) Program Evaluation: helping the Department of Energy (DOE) evaluate programs

The study described by Dr. Young attempted to obtain short-term impact data on four DOE lab sites. Initial surveys went out to about 80 teachers in this pilot study.

The evaluation tool was an examination of "classroom practices." Teachers were asked to describe their best lesson. These descriptions were compared to "best practices" as outlined by recent reform efforts. Three samples of teachers were then selected: 1) Some who demonstrated "best practices;" 2) Some who were "so-so;" and 3) Some who seemed to be more traditional teachers.

Pre-placement data were gathered by visiting classrooms, interviewing students, and examining teacher logs. During the summer program, sites were visited and additional data were gathered by interviewing mentors and teachers, working with focus groups, and through staff interviews. At the end of the summer placement, a mentor and a participant survey was done.

In the spring of the following academic year, classroom visits were again held. Classrooms were observed, teachers, students and principal/department chairs were interviewed, teacher logs were examined, focus group discussions were held, and a follow-up survey of participants was carried out.

Classroom outcomes related to both overall changes in teaching practice and specific changes for different teachers. Information on classroom outcomes was shared by Young, who described the practices of nine teachers who were part of the study. The results of the study of 14 items on the "best practices" framework produced only one statistically significant result. That item showed that teachers offered fewer topics, each of them in more depth, as a result of their summer experience. According to Young, the immediate outcomes pointed out the need to do long-term outcome assessments.

During the question and comment section, several participants pressed the issue of how an outside evaluator can specifically help program managers convince prospective funders of a program's impact. Young could not give much help on this question, except to recommend that professional evaluators should be involved in an evaluation program.

Program Coordinator Workshop: SWEP Evaluation Efforts

Presenters: Jay Dubner, Columbia University Summer Research Program for Secondary Science Teachers, New York, NY
Violet Rohrer, Business Fellowship Program, Spring Arbor College, Spring Arbor, MI

Recorder: David Tanis, Teachers in Industry Strategy, Grand Valley State University, Grand Rapids, MI

Dubner emphasized the following points about an evaluation conducted of Columbia's program:
1) The evaluations were to help guide the program's development.
2) The evaluations were for the funders of the program.
3) Those doing the evaluation expected meaningful understanding of science on the part of students as the outcome of the summer experience.
4) The program has been tracking students it has impacted over the years.
5) Successful program evaluation must involve a partnership with school administration.
6) Statistics on teacher's action plans (a required part of the Columbia program) were shared.
7) Up to now, all information has been collected from teachers. This is likely a weakness of Columbia's evaluation methodology.
8) Dubner has made use of the data collection and manipulation services of the New York City Public Schools to help evaluate the program.

His conclusion is that evaluation can be accomplished by program administrators, but that it is hard to get numerical data. Most of the data are anecdotal.

The program at Spring Arbor College is a very small, self-funded program involving teachers of all subject areas. Rohrer very briefly described the evaluation of the program, developed by a math education professor from Spring Arbor. This evaluator has produced two reports, which were made available to the session participants.

Participants seemed to have many unanswered questions about evaluation at the end of the session. The level of frustration evidenced by participants after this session indicates the challenge of doing meaningful evaluation.

Program Coordinator Session: TRAC Program Coordinator Issues

Facilitator: Eileen Engel, Lawrence Berkeley Laboratory TRAC Program, Berkeley, CA

Recorder: Dr. Nina Leonhardt, Brookhaven National Laboratory TRAC Program, Brookhaven, NY

The group brainstormed issues for possible discussion in this Roundtable and decided to focus on facilitating transfer to the classroom, and second and third year TRAC experiences.

Facilitating Transfer to the Classroom
Transfer is a TRAC goal. Transfer should include content, appreciation of the research process, confidence, positive attitude toward science, enthusiasm, and pedagogy of teaching science.

Evidence of transfer may take a long time to fully develop. What is transferred?
1) Notion of real research
2) Classroom materials/lessons
3) New philosophy ("life changing experience")
4) Concept of open-ended classroom experiences
5) Team approach
6) Comfort with science (self-confidence)
7) Prestige

Strategies to facilitate transfer:
1) Teacher journals that include writing exercises in science and math lessons, e.g., LBL's Incorporating Writing in Science and Math
2) Storyboarding
3) Improved/increased communication between teacher and scientist
4) Teacher presentations as part of TRAC
5) Newsletters, mailing lists
6) Programs should share experiences, e.g., TRAC Handbook

Program evaluation needs to address how to ensure that transfer has occurred.

Second and Third Year Experiences
1) Present structure allows for one returnee for every ten participating teachers, with a maximum of two returnees.
2) Can a lab with a small TRAC program (<10) "accumulate credits" for several years to obtain a returnee?
3) Can a lab with a large program (>20) get more than two returnees?
4) Can a previous participant who is an ethnic minority return as an additional returnee to provide peer support for minority applicants/new teacher participants?

Recommendations
1) The group felt that additional meetings, perhaps quarterly, of TRAC program managers would be useful.
2) Minority candidates should be encouraged/supported.

Teacher Workshop: Bringing Industry Practices into the Classroom

Facilitator: Julie Dunkle, IISME San Francisco Bay Area, Mission San Jose High School, Fremont, CA

Recorder: Barry Gray, Texas Teacher Internship Program, Clear Lake High School, Houston, TX

Teachers discussed their experiences in industry and what they brought back to their classrooms. Among the items mentioned: new classroom management skills; new "business vocabulary" and terminology from their particular industry; new methods of identifying goals, forming projects and formulating questions. Julie discussed how New United Motor Manufacturing (NUMMI), her summer employer, had forms in order to procure money for anything that helped identify exactly what you wanted to do and get a clearer understanding of why the money was needed. She suggested that such a requirement would help students on their projects.

Teachers discussed pros and cons of group work. Chris Fraley said that students often have little input on what they are learning or doing and how they are going to do it. Another teacher said that just getting into a circle does not always make a team; often the loudest person becomes the leader, and some students are left out. Teachers said they formed groups both by appointing the team members and also by letting the students choose the group members. Some pointed out that not all kids work well in groups: some try to do all the work and some don't do any. Teachers want all kids to be successful. One idea was to let group members rotate jobs such as group leader, recorder, etc.

One question was whether teachers should bring back everything they see in industry to the classroom. And if not, what should be brought back and what left behind? For example, teachers had seen employees take credit for work by, or steal work from, fellow employees. They pointed out that a teacher should evaluate their industry experiences, and only bring back to the classroom behaviors and ideas that are appropriate. Julie said that her teaching style was to try a lot of variety in the classroom, to get out of the classroom (i.e., field trips), and to bring in guest speakers.

One teacher said that industries should get together and decide what they can expect and gain from education, instead of a one-sided transfer in which education is always trying to be like industry.

teachers can learn from this is that they should be facilitators of knowledge in the classroom and not just the dispensers of knowledge. Julie gave as an example a young man who had great grades but who did not get a job because he could not function with other people.

Everyone agreed that bringing TQM ideas into the classroom was a good idea, and that teachers should contribute to the student's ability to function in the work force as well as gain knowledge.

Teacher Workshop: Creating a Learning Community at Your School or Within Your SWEP (Session A)

Facilitator: Dr. Milbrey McLaughlin, Center for Research on the Context of Secondary School Teaching, Stanford University

Recorder: Ana Butler, Columbia University Summer Reserach Program for Secondary Teachers, Forest Hills High School, Forest Hills, NY

What is a learning community?
1) A learning community is the relationship that revolves among the teacher, the student and the content.
2) It can expand thanks to the ability to communicate with other schools or countries using networks like the Internet.
3) It should include the above, plus administrators and parents.
4) A community is a teacher with a computer.

What strategies can be used to change the so-called "Dinosaur" teacher into an involved teacher?
1) Try to present new ideas or methods to our colleagues without telling them what to do. Do not make them think they are working for you.
2) Respect the more experienced teachers for their content knowledge and use their experience as a resource.
3) Discussing scientific problems can bring unity among a group of teachers.
4) Take the time to find out what their special interests are.

How can time be arranged to design a suitable lesson and find ways to implement our summer experience in the classroom?
1) When developing a program, include some common time or personal grouping time during which teachers can communicate with one another and work on classroom transfer activities.
2) A four-day work week and fifth day of administration.
3) Half day on Wednesdays for administrative work.
4) Team teaching certain subjects could free up some time but time is still needed when both teachers are free in order to plan lessons.
5) Integration on a school-wide basis.

What can be done when teachers that are "doers" are blocked by administrators?
1) Teachers can work around obstacles by giving and taking.
2) Invite teachers and their administrators to SWEP programs to inform them of the great progress and energy that exist in their own schools.
3) Aid administrators in understanding how to exchange ideas among teachers, students, and the outside world.
4) Include administrators in SWEP or other programs.

Unanswered questions or issues
1) When integrating classes, who gets the most say and how do you work it out?
2) How do you convince parents that the "pronounced innovated" form of teaching (integration) works?
3) How can over-crowded schools implement any new ideas into their classrooms?
4) How can we make administrators aware of strategies for working more effectively with teachers?
5) How do we transform a "B" school into an "A" school?

Teacher Workshop: Creating a Learning Community at Your School or Within Your SWEP (Session B)

Facilitator: Dr. Joan Talbert, Center for Research on the Context of Secondary School Teaching, Stanford University, Stanford, CA

Recorder: Craig Booher, Business Fellowship Program, Napolean High School, Napolean, MI

Issues and problems in creating a learning community were discussed. Some teachers feel marooned on an institutional island, resulting from little cooperation among staff. Questions were raised about the need for critical mass -- a minimal number of change agents before the community improves. One idea was the integration of curricula to strengthen the staff. The importance of an aggressive administrative attitude toward change was noted, and professional development was stressed. Common planning time and sharing of ideas was also seen as vital.

Positive results of summer experiences were given. School evaluations of internships and the use of Total Quality Management (TQM) were cited as changes which have occurred. At one district, teachers and administrators now collaborate after workshops in order to apply different educational concepts across the curriculum. Some schools also have dedicated days where a teacher brings a different teaching idea to the rest of the staff. School presentations of summer experiences were also seen as positive.

Teacher Workshop: Getting Beyond the Cubicle--How Teachers Can Enhance Their Summer Experience

Facilitator: Sandy Van Natta, Partners for Terrific Science Industrial Internship Program, White Oak Middle School, Cincinnati, OH

Recorder: Carl Steven Rapp, University of Rochester and NSF Science and Technology Center Summer Research Programs, University School, Johnson City, TN

Teachers related experiences during and after their summer internship which extended the internship's benefits or impact in the classroom.

Tapping into Surplus or Loaned Equipment
After participating in the National Science Foundation's Program at the Center for Photoinduced Charge Transfer at the University of Rochester, Carl Rapp enhanced his classroom instruction by utilizing the scanning tunneling microscope (STM) from the University of Rochester (UR). UR shipped the STM to his school for almost a month. Students got to actually resolve atoms which created a great deal of excitement at school. Even parents became excited, with several coming in for an open house in which the STM was explained to them. Their enthusiasm for the science program is still evident.

Time for Exploration and Classroom Transfer
Many companies allow teachers access to employee training sessions and the company library. Some allow teachers to observe high-level management meetings. Teachers can learn a lot by spending their lunch hour talking with employees in other departments and job functions.

The Martin Marietta Fellowship Program and many others ask that ten percent of the teachers' time in the industry or university environment be devoted to lesson plans, curriculum development, or other transfer activities.

Post-Fellowship Contact with Mentors
The message here is that it is important to keep in contact with mentors. Doris Tucker utilized her industry contacts from the VISION program in North Carolina to arrange a field trip for 42 students, exposing them to the company's technology. Mentors can help arrange tours, educational support in the form of company employees, attendance at company training programs for both teachers and students, etc. They can help provide career information and ideas about problem solving.

Other effective ways to keep in contact with mentors were discussed: hand-written thank you notes from the teachers and students; phone calls; e-mail; recognizing mentors in newspaper articles (with mentor's permission); asking mentors to co-teach a class, present a lesson, or visit on career day.

Teacher Workshop: Interdisciplinary Teaching

Presenter: Van Schoales, Bay Area Coalition of Essential Schools, Redwood City, CA

Recorder: Ken Toledo, IISME VISION, Serramont Middle School, San Jose, CA

The Coalition of Essential Schools was founded in 1984 by Ted Sisor, of Central Park East, New York, on nine common principles:

1) The school should focus on helping adolescents learn to use their minds well. Schools should not attempt to be "comprehensive" if such a claim is made at the expense of the school's central intellectual purpose.

2) The school's goals should be simple: that each student master a limited number of essential skills and knowledge areas. While these skills and areas will, to varying degrees, reflect the traditional academic disciplines, the program's design should be shaped by the intellectual and imaginative powers and competencies that students need, rather than necessarily by "subjects" as conventionally defined. The aphorism "Less is More" should dominate curricular decisions, which should aim for thorough student mastery and achievement rather than an effort merely to cover content.

3) The school's goals should apply to all students, while the means to these goals will vary with the students. School practice should be tailored to the needs of every group or class of adolescents.

4) Teaching and learning should be personalized to the maximum feasible extent. Efforts should be directed toward a goal that no teacher has direct responsibility for more than 80 students. To capitalize on this personalization, decisions about the details of the course of study, the use of student and teacher time, and the choice of teaching material and specific pedagogies must be unreservedly placed in the hands of the principal and staff.

5) The governing practical metaphor of the school should be student-as-worker, rather than the more familiar metaphor of teacher-as-deliverer-of-instructional-services. Accordingly, a prominent pedagogy will be coaching, to provoke students to learn how to learn and thus teach themselves.

6) Students entering secondary school studies are those who show competence in language and elementary mathematics. Students of traditional high school age but not yet at appropriate levels of competence will be provided intensive remedial work to enable them to quickly to meet these standards. The diploma should be awarded upon a successful final demonstration of mastery for graduation -- an "exhibition." This exhibition by the student of his or her grasp of the central skills and knowledge of the school's program may be jointly administered by the faculty and by higher authorities. As the diploma is awarded when earned, the school's program proceeds with no strict age grading, and with no system of "credits earned" by "time spent" in class. The emphasis is on the students' demonstration that they can do important things.

7) The tone of the school should explicitly and self-consciously stress values of unanimous expectation ("I won't threaten you but I expect much of you"), of trust (until abused), and of decency (the values of fairness, generosity, and tolerance). Incentives appropriate to the school's particular students and teachers should be emphasized, and parents should be treated as essential collaborators.

8) The principal and teachers should perceive themselves as generalists first (teachers and scholars in general education) and specialists second (experts in one particular discipline). Staff should expect multiple obligations (teacher/counselor/manager) and a sense of commitment to the entire school.

9) Ultimate administrative and budget targets should include, in addition to total student loads of 80 or fewer pupils per teacher, substantial time for collective planning by teachers, competitive salaries for staff, and an ultimate per-pupil-cost not to exceed that at traditional schools by more than 10 percent. To accomplish this, administrative plans may have to show the phased reduction or elimination of some services now provided in many traditional comprehensive secondary schools.

The main features of "Essential Questions"
1) Go to the heart of a discipline. EQ's raise many important aspects at once.
2) Have no one obvious right answer. EQ's are controversial.
3) Encourage higher order thinking. EQ's involve analysis, synthesis, evaluation.
4) Allow for personalized interest. EQ's give students choice.
5) Encourage thoughtful habits of mind. For example: From whose viewpoint are we seeing or reading or hearing? What's the evidence, and how reliable is it? How do we know when we know? How are things, people and events connected to each other? What's new and what's old? Have we run across this idea before? So what? Why does it matter?

Examples of Essential Questions
1) What is an appropriate metaphor for the earth? Is it like a machine, an organism, or something else? What is the evidence? (Consider earthquakes, volcanoes, and earth history.)
2) What is motion? How do you know and measure it? (Consider planetary motion and a roller coaster.)
3) Do chemicals benefit society? (Consider AIDS and pollution.)
4) How does math reflect the way the world works?
5) How does one know that what is known today is correct?
6) How much longer will our world last?
7) How did biological forces shape the course of history?
8) Where is there evidence of patterns in nature?
9) What is the effect of sound?
10) What makes a chemical safe or toxic?
11) Do some natural "disasters" have beneficial results?

Unanswered Questions/Unresolved Issues
1) How do students demonstrate their mastery of the Essential Question?
2) When is content taught?
3) How is this integrated curriculum perceived by big universities in regard to admissions?
4) Is there any research on students from Central Park East/Harlem about how do they do in college or on statewide entrance exams?

Workshop for Teachers: TRAC Teacher Issues

Facilitator: Michael Thibodeau, TRAC-Lawrence Berkeley Laboratory, Marblehead High School, Marble Head, MA

Recorder: Bernard Lefebvre, TRAC-Brookhaven National Laboratory, Hauppauge High School, Hauppauge, NY

The group discussed the possibility of veteran TRAC teachers becoming mentors for a new teacher about to begin a TRAC program. Members supported this idea strongly, stating that mentor teachers could be a source of encouragement for new TRAC teachers, while helping them with their accommodation and in general being available for any kind of support they might need. This additional involvement would also allow mentor teachers to focus on ways of transferring their TRAC experience to the classroom. Participants asked that the mentor program be retroactive, if it ever becomes adopted as a component of the TRAC model.

The idea of a "lab journal" for students was suggested as an outcome of the TRAC program. This transfer idea could integrate the teaching of English along with the scientific or technological content. Some teachers suggested offering extra credit to students who keep a lab journal, especially one formatted on a computer.

Other issues were briefly discussed
1) The selection of TRAC teachers is the responsibility of each lab site.
2) About 200 teachers have gone through the TRAC program (Editor's note: The *SWEP Directory* shows 1,178 teacher placements between 1989-1993).
3) Transportation and living accommodations seem to be a persistent problem for long distance participants. It was suggested that placements should be made close to home to solve these problems and also to encourage teachers and mentors to stay in contact with each other.

4) Participants feel TRAC teachers should be paid weekly instead of every two weeks.
5) Participants suggested having a referral service by region.
6) Linking TRAC teachers via the Internet was suggested.

Teacher Workshop: Using Technology in the Classroom (Session A: From Graphing Calculators to Computers)

Facilitator: Shirley Bhatt, IISME San Francisco Bay Area, Concord High School, Concord, CA

Recorder: Alma S. Greer, TRAC-Oak Ridge National Laboratory, New Hope High School, Caledonia, MS

"The National Council of Teachers of Mathematics suggests that all students use technology such as computers and calculators on a regular basis. Unfortunately students frequently have little access to computers except in labs or as a demonstration tool used by the teacher. Some departments have several desktop PC's on carts with projection devices that a few teachers are able to use. However, our students are required to understand the newest technology and be able to use it. The 1995 AP Calculus Exam will require the use of graphing calculators. The SAT introduced the use of calculators on the 1994 test. In order to be able to use the newest technology, it must be available on a regular basis."

-- Shirley Bhatt, Concord High School

Recommendations for the Use of Graphing Calculators

1) Graphing calculators such as the TI-81 and TI-82 should be available to all students on a daily basis, since the prices are reasonable. They have computer-like features, such as programmability, built in software, and display screens. They provide an opportunity for students to visualize mathematics while making learning more exciting.
2) Have students solve problems graphically and show the analytical solution.
3) Have students solve problems analytically and show the graphic solution.
4) Have students solve graphically when there is no other way to find the solution.
5) Use the graphic calculator to graph linear equations and zoom in on a specific area.
6) Graph parabolas and sine curves.
7) Use the graphic calculators to graph histograms from statistical data.
8) Have students use the library to research the information.
9) Examine graphs that are tangent at the point of tangency by boxing and zooming in on that section of the graph.

Issues Raised and Solutions Proposed

1) Loss of memory as a result of failed battery
   -- Remove/replace one battery at a time.
2) Technical assistance needed for TI calculators
   -- Call 1-800-TICARES .
3) Students cheating by using the programming ability of the graphic calculator
   -- Clear the memory of all calculators prior to using.

Teacher Workshop: Using Technology in the Classroom (Session B)

Facilitator: Dennis K. Williams, Educator Excellence Program, Sunset High School, Beaverton, OR

Recorder: Sherry Freehill, Colorado Alliance for Science Summer Fellowship Program, Harrison High School, Colorado Springs, CO

The discussion started with an explanation by Dennis Williams about a program in his school called Suntec. Suntec is a technology program designed for students who learn better with a project-centered, hands-on approach. Some of the qualities of Suntec include:

1) Two classes of 15 students each, five teachers, three periods a day.
2) Students start in 10th grade and must stay in program through 12th grade.
3) The program received a grant to purchase Macs; the technology lab already had IBMs.

4) Students use TI-81 and TI-82 programmable calculators.
5) Students use FAST-CAD, AUTO-CAD, spreadsheets, and databases.
6) Computers enable students to perform difficult concepts and at a higher level without a strong math background.
7) All students in this program have gone on to further training after high school (tech school, community college, or four-year college). Without Suntec, most probably would not have continued their education.

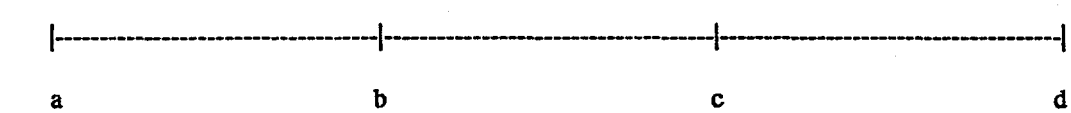
Ideas for Using Technology in Science and Math Classes
1) Using computers to collect and process data alleviates tedious calculations.
2) Computers provide simulations of processes which cannot be observed.
3) Graphing calculators are useful in Algebra, Trig, and Technology classes.
4) Laptop computers are being used for home-bound students to reduce the teacher-load for tutoring these students. If laptops become available to teachers, funding for staff development is necessary.

Roundtable Discussion: Alliances and Compacts

Facilitator: Tamra Busch-Johnsen, Washington County Business-Education Compact, Beaverton, OR

Recorder: Brian T. Walenta, Texas Alliance for Science, Technology and Mathematics Education, College Station, TX

Definition
According to NAPE, coalitions and alliances serve as an umbrella organization and a clearinghouse; they serve many districts.



a = School Business Partnerships - Adopt-a-Schools, etc.
b = Programmatic - Specific projects in industry
c = Compacts/Alliances
d = Policy Changes/Legislative Programs

First Steps For Building A Compact
1) Bring together of members of groups.
2) Create steering committees ---> find board members.
3) Serve as driving force.
4) Communication.
5) Involve all levels of industry/government/education.
6) Provide formal and informal education.
7) Help draft legislation.
8) Look at other compacts so you do not reinvent the wheel.
9) Board make-up is important.

Building Critical Mass
1) Work with teachers in school area.
2) Work with students in school.
3) How many teachers make up critical mass?
4) Work with your state in building a partnership for your programs.
5) Try to build mass within a school.
6) Build on regional areas & support.
7) Community support.
8) Parent-school-industry-student.

Support for Programs/Pushing Industry for Support
1) In-kind contributions
2) Board cooperation/Executive Committees
   - Goals/Objectives
   - Political Support

Networking/Teacher-Level Coalitions
1) Most programs are "design down" and "deliver up." Need to have more "design up" from teachers.
2) Curriculum Implementation Plans/Action Plans need to be sent out.
3) Investigate partnerships with ERIC. For information, contact David L. Haury or Linda Milbourne at ERIC/CSMEE, 1929 Kenny Road, Columbus, OH 43210-1080, 614-292-6717, ericse@osu.edu.
4) Eisenhower National Clearinghouse - Contact your State Eisenhower Clearinghouse.

Coalition Staff Size
1) Partner with past interns to help support members.
2) Be careful about starting out too big.
3) Be careful about spreading your staff or activities too thin.
4) Have a board member who has the vision defined.

Roundtable Discussion: Creative Financing to Achieve Education Reform (Session A)

Facilitator: Joanna Fox, Georgia Industrial Fellowships for Teachers, Georgia Institute of Technology, Atlanta, GA

Recorder: Charlesann Goode, VISION-North Carolina, North Carolina Science and Mathematics Alliance, Charlotte NC

Eisenhower funds were suggested as a likely source for program funding. State legislatures demand school curriculum issues be addressed. Although the pool of Eisenhower funds has increased, the dollar amount allotted for science and mathematics has not increased. New legislation goes into effect October 1, 1995 which requires that funds be spread across the entire curriculum base.

Funding for the various organizations represented in this session was provided (mostly) by corporate sponsors. In the case of research industries, funding was provide by several agencies.

Some agencies fund their programs one year in advance by working on funding now for next year. Wherever possible, this is a highly recommended strategy.

Other suggestions
Endowments: To avoid "burn-out" of long term funders, some agencies are sponsored by a corporation for a period of five years or so. The evaluation piece plays a very important role at the end of the funding period and would be highly instrumental in seeking an additional term from another source. The evaluation would show the exact importance of the program and would specify the changes that have resulted.

Hughes Grant: It was suggested that businesses and industries lobby Hughes to include SWEP initiatives among the types of programs they fund in the future.

Ideas for Proposal Development: Approach funding organizations with a packet that delineates a certain "buy-in" required of the participating industry. In addition, specifically detail to them how the funding will be spent. When deciding whether or not to sponsor the program, Organization "A" may be willing to pay $X for teacher stipends while Organization "B" may be willing to pay $x for administration and or program coordination.

Additional Possible Funders: Private foundations, federal/local agencies, local system funds, Department of Energy, Environmental Protection Agency, the National Science Foundation, state education programs, etc.

Roundtable Discussion: Creative Financing to Achieve Education Reform (Session B)

Facilitator: Bill Korpa, Roseburg Business Education Compact, Roseburg, OR

Reporter: Ted ter Haar, Teachers in Industry Strategy, Grand Valley State University, Grand Rapids, MI

Observations
1) Programs getting money have greater ties to local communities.
2) More industries need to be brought into the loop.
3) Funding sources must always be a top priority for program implementation. Those involved need to be very aware of what sources exist.
4) Industry connections must be tapped. Corporations need to be brought along as to how they can help SWEPs and benefit from them.

Ideas Shared
1) Smaller pieces of programs perhaps can tie into local funding.
2) Work to obtain coalition grants.
3) In looking for funding, search for funds designed to create change in teachers, who will then affect change in students.
4) Know what funds are available in your state. Know where the state DOE is on the funding issue.
5) Develop foresight in knowing the state's directions in program funding.
6) Know business and how it perceives its role in issues we are concerned with.
7) Know your local resources. Bring them along and keep them informed.
8) Develop the concept of sub-contracting a SWEP program to a corporation, i.e., math teachers to help teach in a corporation, biology teachers to help train in smaller companies, curriculum development for companies, etc. Propose corporation-purchased, SWEP-developed projects which will benefit the corporation.
9) Have teachers use the United Way checklist to contribute to SWEPs. It has been done.
10) Use technical/professional consortiums and professional organizations.
11) SWEPs must contact foundations, trusts, or other scientifically connected industries.
12) When submitting for funds, ask for LOTS of money. Administering large or small grants is the same.
13) Secure state literature on grant writing and grant locations. "Apple Corp" has done it in Texas; perhaps they do it for all states.
14) Know how to write grants. Need to demonstrate your successes and discuss future needs.
15) Internet has a list serve for grant sources.
16) Be proud of SWEP! Sell it!
17) Solicit companies at fiscal year end for possible equipment contributions. They discard; we can benefit.
18) Be aware of lottery funds from the state.
19) Gaming revenues from Indian reservations may be available.
20) Various state legislatures attach funds to work-force development.
21) Use federal and state surplus warehouses.

Roundtable Discussion: The Discrepancy Between Expectations And Outcomes

Facilitator: Karen Pomeranz, Teacher Release to Industry Program (TRIP), Deakin University, Burwood, Australia

Recorder: Susan DeRiemer, Meharry Medical College Outreach Program, Nashville, TN

Facilitator's Introduction: The topic was chosen because the TRIP program, after four years, has met its initial objectives, but other "unexpected outcomes" have emerged. The facilitator asked the panel to discuss:
1) The outcomes and goals for their programs and who set them (program, local, national agendas?)
2) What unanticipated results programs have had
3) How one should respond to unanticipated outcomes

Goals and Who Sets Them

Program goals were fairly similar among programs: Improve science and technology education; increase contact between schools and academia/industry; improve teacher awareness of workplace and careers. The driving force behind these goals varied depending on the program but included local program organizers/founders, business leaders, state and national governments, and responses to national studies such as SCANS or Workforce 2000. Teachers were visibly the missing link in this process initially, and increased teacher participation in program management and goal setting was one of the changes most programs have now incorporated.

Examples of Unanticipated Outcomes

1) Teachers report increases in cooperation, teamwork, and changes in management style as program outcomes which are as important as (or more so than) application of specific techniques/content learned during their experience.
2) "Happy accidents"-the affective outcomes for participating teachers.
3) Creation of peer communities and networks amongst teachers.
4) Teacher renewal and retention: Teachers feel like "real professionals;" they return to school with an enhanced sense of why they want to teach and the importance of what they do.
5) Teachers become unofficial SWEP program managers, i.e., taking charge of the programs directed at them. Program managers are listening more to teachers, incorporating them into the programs as managers, peer coaches, board members, etc.
6) Teachers are using contacts to meet material (equipment/supply) needs of their classrooms.
7) Better awareness among teachers of where business or government thinks they, as a group, are failing. Teachers and school administrators feel frustrated at the general criticism leveled at them; their industry exposure gives them concrete goals to work towards.
8) Increased awareness in the business community of what teachers do, what the nature of teaching skills are, which are transferable to the workplace, what good models of teaching are, and under what conditions teachers currently work.
9) Business is getting a more realistic picture of what students are like today and hence the pool from which they will be drawing future workers.
10) Business exposure for teachers (and students) is bringing them more actively into the area of systemic reform.
11) Mentors report, almost uniformly, that they have an increased respect for teachers and a decreased respect for public education at the end of a SWEP experience.
12) Program managers find that specific programs and program materials can have a broader impact and audience than their initial targets.
13) Program managers are listening more to teachers and changing the focus of their programs to respond. For instance, the Georgia Industrial Fellowships for Teachers (GIFT) Program is focusing more now on changing the way technology and data are used in the classroom.

Other Issues

1) There was a lively discussion on how the duration of a SWEP experience relates to meeting specific goals. For instance, one of the goals of the 40-week Australian TRIP program is "increased understanding of corporate culture." The consensus of the managers of shorter programs was that this goal was the quickest and easiest to meet and that teachers leave even the shortest programs with the ability to function in a business environment (albeit somewhat less "fluently" than those with longer exposures). Comparison between programs also revealed that businesses will say they don't want teachers for a given period of time because it is too short for the teacher to be productive---no matter what the time is (week, month, or year) so that there is a need for program directors to educate participants as to what are reasonable expectations and outcomes.

2) A comparison of retention rates for teachers in different programs emphasized the effects of external events (often unpredictable and out of program manager or participant control) on the realization of program goals. For instance, the TRIP Program has a teacher retention rate (i.e., teachers staying in teaching) of 50%, but that is against a background of massive layoffs (1/6th of the total teachers in Victoria). The Michigan program also "suffers" from the fact that the local economy is now booming and business is looking for workers. The programmatic response in Australia was to change the business/teacher contract to guarantee teachers their former position and to have teacher's sign that they will not take extended leave or "redundancy" for one year after completing the program.

Roundtable Discussion: Dissemination Derring-Do (Session A)

Facilitator: John Wilson, Gulf Coast SIFT, Stennis Space Center, MS

Recorder: Anita Cole, Washington County Business-Education Compact, Beaverton, OR

Teachers in summer work experiences develop an action plan which is designed to act as a tool to transfer their summer work experience into the classroom. Teachers and program coordinators discussed successful methods for disseminating classroom transfer plans and ideas to a wider teacher audience.

Several programs have built requirements into their internships to help facilitate dissemination:
1) Release time for school and/or district-wide service
2) Peer advisors to facilitate curriculum development meetings among groups of interns within one business, or for small businesses, at a central location. In many instances, these were half-day sessions held one afternoon per week. Release time from employers and attendance at the sessions were mandatory.
3) Mid-summer meetings for interns to share experiences
4) Master teacher meetings with mentors
5) Workshops

Other suggested dissemination tips:
1) Stipends, funded through businesses and associations, to replicate materials and kits developed
2) Newsletters
3) Internet access to action plans
4) Videotape to record experiences and outcome
5) Sharing of information, dates, and financial resources to enable teacher interns to attend conferences
6) Curriculum development teams: General Atomics, a San Diego business, put together a team of eight educators and business mentors (volunteers) over a period of six to eight months to develop curriculum and materials for dissemination. The group targeted were 7-12 grade science teachers. Materials to develop these science kits were provided by the business, which also sponsored workshops for dissemination.

Roundtable Discussion: Dissemination Derring-Do (Session B)

Facilitator: Tina Demirdjian, Partners in Science and Industry Program, Los Angeles Educational Partnership, Los Angeles, CA

Recorder: Dr. Pamela Lucas, TRAC-Princeton Plasma Physics Laboratory, Princeton, NJ

Major items discussed included to whom information regarding classroom transfer plans should be disseminated. Suggestions included other teachers, school administrators, parents, community members, students, businesses, universities and colleges, professional and community organizations.

Suggested Dissemination and Public Relations Mechanisms
1) Teleconferencing geared to teachers to show how "to do" science and to industry to recruit sponsors.
2) Dave Tanis shared information regarding a book of activities written by teachers who participated in a summer experience. The book, *Teachers in Industry-Science and Math Activities*, geared for grades K-12, is available through his organization for $23.00. Teachers can share this guide with others who are unable to do an internship, conduct workshops for other teachers, and lead them through the activities. The address for the manual is: Grand Valley State University, Teachers in Industry Program, 233 Mackinac Hall, Allendale, MI 49401.
3) Meetings with industry people to discuss their needs, and then pass this on to other teachers
4) Inviting school administrators (principals, superintendents, science and math supervisors) to the summer worksites
5) Recognition luncheons and inviting administrators
6) Presentations at professional meetings of school administrators and teachers
7) Talks at PTA and other community meetings
8) At one summer program, the fellows had to invite first-year teachers to see a presentation. The program coordinators teamed paired fellows with others in similar disciplines and did various conferences.
9) The use of e-mail accounts to keep in touch with others was suggested.

10) In Oregon, job shadowing was done for two days to give teachers an idea of what employers were looking for.
11) Tying industry concerns with community concerns -- for example, environmental projects.

Problems Discussed
1) Difficulty encountered when trying to implement transfer strategies. Teachers often had to modify their transfer plans to fit into administrative and time constraints.
2) Resentment from principals and supervisors. Participants felt that parents and the community could be a means to overcome this. If teachers can convince parents, then parents can make demands on the principals and supervisors.

Recommendations for Program Administrators
1) Attend superintendent and administrator conferences.
2) Increase public relations by means of press releases, articles in professional journals, local papers.
3) Involve more than one teacher from the same school.

Recommendations for Teacher Participants
1) Give presentations during staff meetings.
2) Conduct in-service workshops based on summer experience and transfer plans.
3) Encourage teacher colleagues to participate.
4) Develop school plan of study.
5) Take on a leadership position in your school.
6) Participate in systemic change initiatives.

In general, participants felt that dissemination should be used as a tool for recruitment as well as for teachers' classroom improvement.

Action Items For SWEPs
1) Explore teleconferencing as a means of more frequent meetings.
2) Develop a listserv for teacher participants.

Unanswered Questions/Unresolved Issues
1) How to obtain funding to disseminate action plans
2) How to overcome administrative barriers

Roundtable Discussion: Expanding Our Audiences (Session A)

Facilitator: Pat Moore, Educator Excellence Program, Washington County Business Education Compact, Beaverton, OR

Recorder: Judith Royer, Creating Lasting Links, Lesley College, Cambridge, MA

Participants discussed the following target audiences for expanded inclusion in SWEPs:

Elementary Teachers
Many saw a problem in generating interest in industries to include elementary teachers in SWEPs because industry people don't see them as having skills useful for business. Participants' experiences showed that industry will hire the highest level teachers available. One possible solution is to use the application or interview to highlight skill areas other than science skills, such as computer, communication, or management skills that elementary teachers use daily. The group saw two perspectives to the internship experience: as teachers contributing to the company, or as scientists contributing to education.

Elementary teachers are often wary about getting involved in science experiences since they generally have no background in that subject. Suggestions were made that an "exposure" experience may be more appropriate, scheduled for a shorter term and with more support available -- a job-shadowing type of experience. An elementary teacher participant supported those ideas and added that bringing in elementary teams from different grade levels would allow for interdisciplinary and multi-age collaborations in the schools. The Washington County Business-Education Compact and Creating Lasting Links already run successful programs for elementary teachers based on these guidelines. Teachers and coordinators thought it would be wonderful if industry people would shadow teachers as well.

Community College Faculty
Community colleges seem to be in an invisible position, according to some group members. They are often not allowed to apply for grant moneys and have no natural opportunities to connect with K-6 classrooms. Suggestions from the group included: checking out Perkins money, pushing for 2+2 Tech Prep as part of school reform, and watching for the coming DOE initiative that will focus on community colleges. [Editor's note: Readers may want information about the DOE Partnerships for Environmental Technology (PETE) program which places community college faculty in DOE laboratories. The contact is Paul Dickinson at 510/225-0669.]

Pre-Service Teachers
The idea of offering pre-service teacher work experience was discussed. Some participants would like to see undergraduates have actual industry work experience before graduating to teach. One participant warned of a program which offered teaching candidates a SWEP experience with the result that 80% of the students left the credentialing program to pursue industry careers. Others commented that it would be difficult to find space in the curriculum for this type of practicum and that the work involved in developing and supervising so many placements would be a burden on faculty. One suggestion for finding the placements was using an alumni database, asking for assistance from graduates. No conclusions were reached.

Other Higher Education Connections
It was noted that many SWEPs are industry-driven and include no higher education connection. Some have noticed an issue with competition between K-12 and college professors for industry slots. They are therefore not interested in connecting with higher education. The current role being held by higher education institutions in some SWEP partnerships often seems to be a minor one, such as providing office space and clerical support.

Stronger National Connections
Another major topic of discussion was the need for a national clearinghouse on SWEP partnerships. Participants mentioned that Eisenhower, ERIC and EXXONnet might be used as national clearinghouses if projects would list themselves. MOSAIC could also be useful if people have access, but that is often a problem for teachers who either don't have the equipment or the training for Internet use.

Another aspect of national connections is the need for articles in national journals or magazines. This would be a useful tool for recruiting new industry participation. Suggestions were made that teachers, scientists, or coordinators write articles that could be submitted to the professional journals of industry and education.

Recommendations
1) Participants would like to have a place designated as a national clearinghouse of SWEP projects, including an electronic bulletin board for questions and discussions.
2) Participants would like to have IISME, The Triangle Coalition, the Department of Energy and other large organizations try for more national publicity for SWEP partnerships, such as writing articles for national publications oriented toward industry people.

Roundtable Discussion: Expanding Our Audiences (Session B)

Facilitator: Pamela Lucas, TRAC-Princeton Plasma Physics Laboratory, Princeton, NJ

Recorder: Donna Light-Donovan, Rockefeller University Science Outreach Program, Hostos-Lincoln Academy of Science, City Island, NY

The workshop was designed to offer participants an opportunity to discuss ways of including in SWEP programs K-8 teachers, pre-service teachers, students, teachers of non-technical subjects, administrators, counselors, teachers of color, and college faculty. Although participants' interests differed, common themes unfolded. While the "scientific experience" varies depending on the program, the participant, and the mentor, the goals are similar: to enhance the teacher's and student's interest and skill level. The discussion focused mainly on including administrators, K-8 teachers, and people of color. We also talked about what does and doesn't work.

K-8 Teachers/Administrators

As an assistant principal of an elementary school, Judi Campbell is interested in having administrators and teachers pair up in the partnership experience. We all agreed that the ability of the teacher to translate the summer experience back into the classroom can depend in large part on the flexibility and support of the school administrator(s). The administrator/teacher pair may be a way of ensuring that the experience can be effectively extended to the school setting. It was pointed out that many teachers prefer to spend the summer with their own children, so an alternative to a summer experience should be pursued.

Nina Leonhardt has run non-research oriented programs in which elementary teachers were paired with technology teachers. The sessions included content and hands-on activities to give teachers a background in the physical sciences. The program designers felt that although none of the teachers had much previous scientific background, the technology teachers would not be afraid of science and the elementary school teachers would be responsive to working in pairs. The designers were right and the program has been successful.

Teachers of Color

Pam Lucas is very concerned about the 26% decline in minority applications to TRAC programs, especially when a concerted effort has been made to recruit underrepresented minorities. She spoke of an African-American teacher in the Princeton Program last summer. The woman was self-conscious because she was the only teacher in the program who did not have computer skills. When Pam offered her the opportunity to take a free course at the Computer Center, she declined because none of the other teachers were attending. In the lab placement, the woman felt snubbed by her mentor although he is, in fact, remote to all those who know him. Pam questions the value of bringing minority students and teachers into such programs if they don't have the support they need.

Students

Donna Light-Donovan described difficulties her student had in working in a lab at Rockefeller University. Although the student and a number of the researchers in the lab were Spanish speaking, the student felt socially and culturally isolated and became defensive. The student also lacked library research and writing skills that other students in the Outreach Program had, and it was difficult for him to "save face". By the end of the summer, though, he had written a fine report of his work and was asking questions that the researchers themselves were asking. He is currently a first-year student at the Columbia University School of Engineering. The Rockefeller University Science Outreach Program has subsequently added structure to the student summer experience so that students who do need additional help have a stronger support system -- e.g., teachers and students meet weekly in groups to discuss their work.

Susan DeRiemer teaches at Meharry Medical College, where all students and faculty are underrepresented minorities. Previously, she taught an Introduction to Biology course to minority high school students at Columbia University's Outreach Program. Susan notices a difference in students' attitudes at Meharry. She feels the students are more self-confident, and she attributes it to the fact that the students do not feel stigmatized. Donna said that a number of her students (mostly Hispanic) were accepted to Bronx Science and Brooklyn Tech (specialized high schools within the NYC Board of Ed which require admittance exams) yet instead chose Hostos, a small alternative community school. Hispanic students generally do not fare well at these specialized schools, yet Hostos students are doing very well in the same courses -- with the same regent's exams at the end of the year. We all agreed that students do well when they feel comfortable in their environment.

Pam feels that some of the students who usually participate in these summer programs have already had a wealth of opportunities and experiences (e.g., their parents are doctors or scientists or they attend a highly academic, fast-paced high school), and most view the experience as just another in a long sequence and tend not to fully appreciate it. She believes that students who might not otherwise have such an opportunity should have priority. We want to attract the "best" students, she said, but perhaps the criteria for determining these students needs redefining.

What Works? What Doesn't?

Royace Aiken coordinates a number of programs, including teacher development programs, a scholarship program for underrepresented community college students, a week-long event for the winners of the Science & Engineering Fair, and a computer and equipment loan program. The community college students work the hardest and have made that program the most successful. Some students are single mothers who are earnestly seeking job skills and have become indispensable in their placement positions. Almost all of these students have excelled and have been highly appreciative of the experience.

Judi spoke of K-5 students who are doing design technology as a result of teacher participation in a partnership program. She would like to know how these students can be nurtured further and not turned off to science.

Pam and Nina both described experiences with teachers who seemed initially to be unreasonably demanding of services -- one teacher's family wanted a television in their room, another invited his girlfriend to stay with him on the campus for the summer -- but both turned out to be excellent participants.

Donna mentioned the Mt. Sinai SETH (Secondary Education through Health) Program in which her students participate. Students do internships throughout the medical center. They also meet in a weekly seminar and complete a series of well-structured assignments leading to a final research paper. The program enables her students to develop unique skills that, in most cases, they would not otherwise be able to.

A supportive structure should be in place for those teachers and students in need of it. As we expand our audiences, we should anticipate that some will feel estranged. If we venture out to find these people, we should be prepared to provide the proper orientation and backup so that the experience will be a meaningful one -- one that teachers, students, and mentors can build upon.

Roundtable Discussion: Linking Into State Systemic Initiatives (Session A)

Facilitator: Dr. Bonnie Kaiser, Science Outreach Program, Rockefeller University, New York, NY

Recorder: Marcy Wood, TRAC-Inhalation Toxicology Research Institute, Albuquerque, NM

State Systemic Initiatives (SSI) vary from state to state. There are a set of common goals, but the states are on their own to designate their programming. A thrust of the program is to close the gap between poverty and wealth.

In New York, the funds are dedicated to teacher training. Rockefeller University used SSI funds to help teachers make connections between research and the classroom. Michigan's SSI is organized on a statewide level with focus districts. Their SSI has several components including curriculum, policy, pre-service teachers, and professional development. Michigan has a lot of activity on higher levels, but not much at the grassroots level. Colorado's SSI has an outreach component in which 12 districts were selected for funding. Oregon's is connected to their state education reform act.

There are also Urban SSI's aimed at the 20 largest urban areas in the U.S. These SSI's encourage partnerships between schools and museums, colleges, or industry.

Roundtable Discussion: Linking Into State Systemic Initiatives (Session B)

Facilitator: Joanna Fox, Georgia Industrial Fellowships for Teachers, Georgia Institute of Technology, Atlanta, GA

Recorder: Bill Williams, TRAC-Continuous Electron Beam Accelerator, Newport News, VA

The facilitator opened the session by providing an explanation of State Systemic Initiatives (SSI) and the goals of the National Science Foundation. The discussion quickly generated a series of questions about the relationship between teacher internship programs and national standards and reform movements:
1) Is there a relationship between national standards, reform goals, and teacher internship programs?
2) Is the concept of SWEP a healthy one?
3) Should we look at something broader than SSI?

Participants generally agreed that teachers involved in an industry program are more aware of national standards, and their experiences in these programs help them make these connections. Concern was expressed, however, that not enough teachers are able to participate in SWEPs. The group also questioned how to expand the experience throughout a school and school division. It was suggested that such an expansion must start from the top down, as well as from the bottom up. Some teachers can learn from other SWEP teachers, while others are unable to learn unless they experience it themselves. It was further suggested that SWEPs need to relate to statewide initiatives and be identified by the state as a viable teacher development program.

Unanswered Questions
1) What is going to set SWEPs apart from other reform efforts?
2) How can SWEPs be a more integral part of state systemic efforts?

Actions Items/Recommendations
1) SWEPs should work within the state education system to be a teacher development activity supporting national and state standards of reform in math, science, and technology education.
2) The Triangle Coalition should develop a strategic plan in accordance with national standards to provide a unifying framework for teacher internship programs.

Roundtable Discussion: More Than Just a Summer Job--Education Support Services (Session A)

Facilitator: Jay Dubner, Columbia University Summer Research Program for Secondary Science Teachers, New York, NY

Recorder: Doris Tucker, VISION-North Carolina, Cool Spring Middle School, Rutherfordton, NC

The general consensus of the group was that SWEI's are extremely worthwhile, but they need to provide more follow-up and support services so that participants' motivation doesn't wane after the summer. SWEPs truly provide more than a summer job; they provide a new way of thinking and doing.

Main ideas from the session were:
1) For many teachers, their SWEP experience was the best professional development ever.
2) The stipend was not usually the primary motivation.
3) SWEPs give teachers a fresh view.
4) SWEPs provide ideas about the relevance of science and math to share with students.

Teachers in SWEPs get to ask questions, form partnerships for later use in school and the workplace, find out about the skills students need, and contribute a new and fresh outlook to industry projects.

Questions
1) How does a teacher get support for his/her ideas when they return to the classroom?

Participants' experiences varied widely from getting wonderful support to no support. Jay Dubner suggested one technique which might increase support at the school site is the placement of a number of teachers from the same school over a few years. They become a nucleus of support for each other and may also serve as pressure to obtain greater support at the administrator level.

Several teachers explained that their specific programs have provided networking capabilities for each participant so that teachers stay in contact after the summer.

Another suggestion voiced by many participants was that administrators should get involved in a SWEP and work in industry or research.

2) How can teachers and SWEPs extend the benefits of the program after the summer?

Industry tours for students are not difficult to set up. This gives the students a first-hand look at the world of work. Alan Bardsley arranged for his students to conduct research at the Navy's Submarine Center in Newport, RI.

Roundtable Discussion: More Than Just A Summer Job--Education Support Services (Session B)

Facilitator: Dr. Ray Hill, IISME San Francisco Bay Area and TRAC-Lawrence Berkeley Laboratory, Lowell High School, San Francisco, CA

Recorder: Alice Krueger, High Plains Consortium for Math and Science, Aurora, CO

Summary: The idea that a SWEP experience is "more than just a summer job" needs to be a clear expectation of the program communicated to potential participants; it is a desired outcome for participants and leads to identifiable student benefits.

Listing the ways in which SWEP experiences are "more than just a summer job", participants cited:
1) Opportunities for professional growth, including "all the intangibles" such as credibility, as well as opportunities for future sabbaticals
2) Networking and connections, including the opportunity to become a Master Teacher, serve as resource to SSI and industry committees, and benefit the students
3) Increased communication, both formal and informal, with other teachers, forming a valuable collegial network
4) Contact with research and industry colleagues, enabling participants to obtain grant writing assistance and to get access to professional publications
5) Improved self esteem and credibility with students and parents
6) Awareness of "big picture" among the varied positions in a business or industry
7) Benefits to colleagues and to students via guest lectures and possible research opportunities for them
8) Material resources, including funding for materials, stipends, donations of surplus equipment and materials, and technical assistance

Unanswered Questions/Unresolved Issues
A concern was shared by one participant that a certain portion of his program's participants were "only in it for the money" and were disruptive to the program. Although several constructive suggestions were shared by other group members (rigorous orientation, formalized written expectations, counseling), the question remains how often this problem occurs, and what to do to avoid it.

Another unanswered question is the effect of SWEPs on teacher attrition (i.e., what percentage of participating teachers are "recruited" by the host company and do not return to teaching?). (Editor's note: IISME San Francisco Bay Area did a long-term study of teacher attrition among its participants and found attrition averaged six percent per year, less than the California state average.)

Recommendation
1) A teacher bulletin board or other electronic means of communication would be a valuable networking tool for SWEPs.

Roundtable Discussion: Nuts and Bolts--Finance and Management Issues

Facilitator: Stephanie Sullivan, Rhode Island Math/Science Education Coalition, Providence, RI

Recorder: Jerry Arnold, IISME Coos Bay, Portland, OR

Participants discussed various issues their SWEPs were grappling with:

Funding Sources and Mechanisms
1) Many programs charge a fee for service/administration for program placement. Fees ranged from $50 per week to $3,000 for an eight-week internship.
2) Grants, e.g., National Science Foundation funding.
3) Membership fee, e.g., Business-Education Compact charges businesses, governments, and schools based on the number of employees in the organization.

4) Contractual agreements with one or more of the following: State Department of Education, Business/Education Alliance, Professional Technical Development, industry associations, state/regional economic development agencies, universities.
5) Contributions (corporate and individual).
6) SWEPs need to develop new strategies to deal with business downsizing.
7) SWEPs could offer incentives for small and medium-sized businesses to participate (lower cost, shorter internships, shared internships?)

Ensuring Program Quality
1) One suggested method to increase quality control is peer-to-peer coaching during the internship.
2) In dealing with teachers who do not complete program requirements, programs might withhold pay, withhold university credit, or bar them from future participation in the program.
3) Incentives, e.g., science credit with tuition reimbursement, information sharing, mini-grants ($500 cash grant to the teacher to be used for projects or pay toward substitute teachers while interns are working on a project) are probably a better alternative to ensure program completion.

Other Program Issues
1) How to keep teacher interest after internship?
2) Computer dilemma--most teacher applicants are Mac literate, while most industry projects are PC-based.
3) Should SWEPs work to get teacher internships mandated as part of teacher professional technical development?

Roundtable Discussion: Public Relations for SWEPs

Facilitator: Don Beck, Florida Summer Industrial Fellowships for Teachers, Cocoa, FL

Recorder: Marsha Lauck, Martin Marietta Graduate Fellows Program, North East Middle School, Havre de Grace, MD

This session dealt with various concerns about public relations for SWEPs. The primary questions regarding "spreading the word" about these programs are: "Who is the audience?" and "What is the message?"

Reaching Teachers
1) When publicizing SWEPS to teachers, coordinators must keep in mind that most programs already get many more applications than available positions.
2) Make sure that each school gets at least two announcements/applications.
3) Some programs such as the Martin Marietta Graduate Fellows Program (MMGFP) have a video that teachers can use/copy in their classrooms to interest students in math/science careers. Knowing where it came from promotes positive feelings about the MMGFP.
4) It is important to maintain good relations with teacher advocacy groups such as unions and educational associations.

Reaching Companies/Potential Sponsors
1) Some organizations will not give money to public institutions because they are already supported by tax dollars. To get around this, set up a private "stand-alone" corporation with 501 (c)(3) non-profit status.
2) Although there are many ways to promote a SWEP to companies, nothing beats "face- to-face" contact.
3) Don Beck had the following suggestions for public relations:
   - Use the TV station at your local community college.
   - Write editorials for local newspapers or send out press releases.
   - Recruit someone from the local media to be on your board.
4) Send CEOs of sponsor companies a letter of thanks to make sure they are aware of their organization's participation.
5) A plaque or other commemorative awarded to sponsoring companies is a nice touch.

Other PR "Tricks or Gadgets"
1) A computer disk and a brief letter to a company can spark interest.
2) A cheap tape recorder and a tape might get people's attention.
3) E-mail for busy scientists and company executives will probably get better responses than phone calls or letters.
4) MMGFP placed an ad in the September 1994 issue of *Science* magazine.

5) MMGFP puts out a monthly newsletter circulated to all current and past teacher participants, sponsors, and potential sponsors.
6) Some advertising agencies will donate a year's support and provide their expertise to publicize a program.
7) Recruit a marketing or PR representative for the board.

Roundtable Discussion: Skill Building for SWEPs--Fundraising and Corporate Sponsor Development (Session A)

Facilitator: Dick French, Partners for Terrific Science, Middletown, OH

Recorder: Jocelyn Rackley, Gulf Coast Summer Industrial Fellowships for Teachers (SIFT), St. Martin North Elementary School, Biloxi, MS

How do we develop/recruit sponsors?
1) Contact Chamber of Commerce members.
2) Contact the co-op program coordinators.
3) Create a database of personal contacts in companies.
4) Contact small business owners. It is projected that 85 percent of this country's economic growth will be in this area.
5) After a successful experience, encourage businesses to promote the program by word of mouth.
6) Work with the business to publish internships in company newsletters.
7) Present how the internship benefits the company and community.

How do we maintain relationships?
1) Exit interviews help to establish a continuity of interest in improving the program.
2) Arrange appreciation luncheon or other event for sponsors.
3) Help establish a collaboration between the mentor and teacher which continues throughout the year.

How do we fund the internships?
1) Collaborate with schools to use Eisenhower Funds to sponsor a teacher.
2) Collaborate with universities to provide graduate credit for an internship.
3) Small businesses that do not have the facilities to sponsor a teacher may contribute money to a fund to help place a teacher.
4) Encourage small businesses to participate every other year if money is not available each year.
5) Reduce the length of the internship to reduce the cost.
6) Apply for grants through NSF and others.

Roundtable Discussion: Skill Building for SWEPS--Fundraising and Corporate Sponsor Development (Session B)

Facilitator: Beth Snyder Jones, Martin Marietta Graduate Fellows Program, University of Maryland, Baltimore, MD

Recorder: Dr. Henry Zot, STARS Program, University of Texas Southwestern Medical Center, Dallas, TX

Several programs represented in this discussion receive support from competitive funding sources including the National Institutes of Health, the National Science Foundation, the Carnegie Foundation, the Dreyfus Foundation, the Hughes Foundation, and the American Association of Immunologists. Special funding arrangements have been made for programmatic support through the New York Times Corporation, Martin-Marietta Corporation, Lockheed Corporation, and state legislatures.

Other coordinators described their programs which contract directly with corporations, government agencies, and universities for their services. Rather than a standard mechanism for funding, the consensus emerged for tailoring the mode of support to the resources available.

With the possibility for injury on the job, the cost of insuring teacher-participants was raised. Worker's Compensation Insurance was provided at the work site in those instances where the company or university treats teachers as employees during their internship. By offering a fellowship rather than employment, other programs pass liability back to the sponsoring secondary school. In one case, teacher interns were insured privately. The diverse methods for insuring teachers reflects decisions made in consultation with work site officials.

Discussants compiled a list of possible sources for funding. Federal funding sources include National Institutes of Health; National Science Foundation; U.S. Departments of Education, Energy, Labor, and Agriculture; Eisenhower Program; FIPSE; State Systemic Initiatives/Urban Systemic Initiatives; 4H Program; NASA; U.S. Food and Drug Administration; and the Environmental Protection Agency. Foundations offering programs for teacher fellowships include Hughes, Ford, Kellogg, Carnegie, National Public Broadcasting, Gannett, and Dreyfus. For scientific societies offering fellowships, FASEB will provide a list. (Editor's note: The *SWEP Directory* lists six professional societies which offer fellowships via its members around the country.)

Ideas were discussed for approaching corporate sponsors. A member of the program's board of directors often can facilitate making initial contact with a corporation. In meeting with corporate officials, it is helpful to bring a teacher participant to validate the program. It is good form to arrange a follow-up meeting at the work site at the end of a program segment.

Roundtable Discussion: Telecommunications for SWEPs

Facilitator: Bob Shayler, IISME-San Francisco Bay Area, San Leandro High School, San Leandro, CA

Recorder: Julie H. Ernstein, Martin Marietta Graduate Fellows Program, Baltimore, MD

Session participants discussed "Why are we here?" and "What are people's expectations?". Responses included comments of a general information-gathering nature such as communication, information transfer, to get feedback from Bob Shayler or Marie Earl about the IISME SWEP telecommunications survey conducted in February 1994, etc. The group agreed that a telecommunications link for the network of SWEP programs would be extremely helpful.

Bob Freehill expressed concern lest we reinvent the wheel with telecommunications (i.e., he felt we must ask ourselves how we can transfer things that are unique to a SWEP program in innovative and useful ways).

Marie Earl posed the following questions for this group:
1) What should the network look like?
2) Who is going to do the work?
3) Should teacher-participants have access to the network?

Some specific possibilities for creating a SWEP telecommunications network included examples/models such as:
1) "Mesa" (a listserv that many of the Portland area people use regularly).
2) Setting up a listserv through the universities that administer a SWEP's e-mail accounts now.
3) "Phys-share", a very specifically-focused example.

Main points raised were that a listserv needs to: 1) be fairly focused, 2) be a permanent or a temporary listserv, and 3) have an editor/monitor.

What should this network look like? It was emphasized that there are a variety of approaches to the listserv (characterized as a sort of "bulk mail"), including World-Wide Web (WWW), gopher servers (as a "folder" on some university's directory), LINX (no graphics), and/or Mosaic (boots up from any platform, see one page of text, use mouse to click on icons and link to other computers with other pages). Then, listserv(s) vs. newsgroups vs. WWW servers vs. gopher servers vs. IRC talk (i.e., Internet relay chat) vs. SeeUCme (face-to-face Internet interaction, based at Cornell University) were thrown in for consideration. The relative merits and shortcomings of each were compared and contrasted, as were the difficulties in setting them up.

Some logistical concerns were raised:
1) Separate listservs for teachers vs. program managers?
2) A way to "tag" messages with a subject line so that one wouldn't have to actually read each message?
3) How to get and keep people involved?
4) Where do we go from there (i.e., do we want to then move on to a WWW server)?

Action Items
1) Of the six items under consideration, participants elected to focus on a listserv. Marie Earl volunteered to be responsible to see that this gets done as a post-conference activity. Ultimately, we're probably talking multiple listservs here, but we need to start with just one.

2) We might ask NTIA for $20,000-$30,000 to form a national telecommunications network. There should be a joint NTIA-NSF solicitation.

3) Lauren Williams suggested that the Eisenhower Consortium/National Clearinghouse might be receptive to taking on the relatively large task of administering and maintaining such a project. She volunteered to approach the Eisenhower Consortium to see if/how they're willing to get involved. She'll put the response on the above-mentioned listserv or relay this information to Marie Earl.

4) Kurt Gustafson suggested that we not make the WWW server the second priority, but that we make a gopher server the second task. Bob Shayler said that this will be farmed out to someone else (who?) to do. TRAC has the most participants, therefore Bob Zafran will speak to Royace Aiken about this.

5) It was suggested that this listserv might be called SWEPNET.

6) The group agreed that this seemed like a solid foundation. Someone recommended that the next SWEP conference include an online demo as a way of evaluating the success of the discussions we're having right now.

Conclusion and Recommendations

Conference participants were asked on the evaluation form as well as in the Plenary Session *The State of the SWEP Network: Where Do We Go From Here?* what their SWEP's greatest need was. Most commonly mentioned needs (in order of priority) were:
1) To share ideas, information and experiences with other programs
2) To identify new funding sources
3) Program evaluation and assessment tools and advice
4) Mechanism to learn about available resources, opportunities, information, and best practices

When asked how IISME could/should help foster a strong network among SWEPs, the following suggestions were most common (in order of priority):
1) Setting up a communications link on the Internet for all SWEP managers and teachers
2) Publishing a newsletter or regular mailing
3) Organizing an annual conference
4) Setting up a clearinghouse/umbrella organization for the dissemination of information and contacts
5) Setting up an archive/library/resource center with a database, videos, slides, etc.

Based on this feedback, IISME plans a number of follow-up activities. The Intel Foundation has generously agreed to fund 2, 3 and 4 below. Plans include:

1) These **Conference proceedings** were issued to all participants and funders in early 1995, as well as to others in the SWEP database which IISME maintains.

2) IISME plans to publish at least one additional issue of ***Network For Success***, the newsletter for SWEPs in the spring of 1995. Topics for this newsletter will be taken from suggestions of conference participants. IISME encourages the participation of other SWEPs in writing the newsletter. If funding is available for additional issues, IISME will invite and provide funding for rotating guest editors to take responsibility for the newsletter content.

3) IISME will create **SWEPNET**, an electronic mail list to link all SWEP program managers and teachers. Triangle Coalition has agreed to explore the possibility of using Mosaic home page communication linkages. Ongoing management of this network by IISME would be contingent on funding. This project is in response to the Roundtable discussion about *Telecommunications for SWEPs,* the recommendations from many of the other Conference Roundtables, and the survey of telecommunications interest and capability which IISME compiled from SWEP program managers in February 1994.

4) Informal discussion among program managers at the conference indicated that assessment was probably the biggest topic of concern to them. IISME will explore the possibility of researching, writing, and disseminating a **white paper on the subject of SWEP evaluation.** The purpose would be to survey what efforts have already been undertaken by individual SWEPs, their methodology and results, describe the U.S. Department of Energy TRAC assessment methodology and results, and identify promising models and areas of need.

5) IISME, in conjunction with a handful of other SWEPs around the country, is committed to exploring the possibility of a **national evaluation effort** of a number of SWEP models. Such an effort would provide a vehicle for developing and testing assessment strategies that could eventually be adapted and used by all SWEPs. It could be coordinated so that participating SWEPs could amalgamate their data with those of other programs to present a national picture of the impact SWEPs have on teachers and students. This evaluation project would be contingent on obtaining additional funding. (Program managers attending the conference expressed especially strong interest in this topic. Most felt the large evaluation project of the Department of Energy TRAC program currently underway did not provide an effective model for assessing smaller, individual SWEPs, especially in measuring long-term teacher and student impact.)

6) There is strong interest in **another SWEP conference.** IISME will explore the feasibility of organizing periodic meetings in the future or assisting other organizations to do so.

Conference Evaluation

Conference attendees were requested to evaluate each session of the conference as well as the overall usefulness of the meeting. Eighty-four participants responded. Highlights of this evaluation included:

71% reported that their expectations for professional development were "well met" or "extremely well met" by the conference.

79% reported that the conference overall was "very useful" or "extremely useful."

Evaluations of individual Plenary and Roundtable sessions varied widely, but overall 70% of respondents reported that these sessions were "very useful" or "extremely useful."

In addition to asking participants to rate the usefulness of conference sessions, they were asked about the projected impact of the conference and reported the following:

96% made useful contacts at the conference.

96% plan to have post-conference contact with folks met at the conference.

95% of the teachers gained new insights or ideas which might be useful in their classroom or school.

83% of the teachers reported that the conference expanded the value or benefits they derived from participation in their local SWEP.

92% of program managers plan to broaden their efforts to disseminate program information to other groups, as a result of the conference.

57% of program managers plan to make changes in the ways they assess their program, as a result of the conference.

89% of program managers were able to expand their knowledge base regarding the management and/or future directions of their program, as a result of the conference.

In addition to providing feedback on the evaluation form, a large number of participants either verbally expressed their appreciation for the opportunity to meet, or did so after the conference. The following were a few among many unsolicited comments IISME received following the meeting.

"Thanks again for an absolutely fabulous exchange of ideas and materials at the recent SOSII Conference. I know that the members of our program (two coordinators and four teachers) who attended are still talking about the incredible strategies and ideas that conference discussions spawned. We came back with a lot of good ideas as well as a clearer focus on where SWEPs in general are headed."

Julie Ernstein, Outreach Coordinator, Martin Marietta Graduate Fellows Program, University of Maryland

"I really appreciated the opportunity to meet and talk with people from other SWEPs. I came away even more convinced that industry internships for teachers are playing an important part in every education reform movement. The ultimate winners are the students in these teachers' classrooms."

Dave Tanis, Program Manager, Teachers in Industry, Grand Valley State University

"I cannot express enough gratitude for the hours and money invested in organizing this conference. There are lots of little ideas I gained by attending the various sessions and interacting with some very inspirational peers, but what stands in my mind the most is this: Thanks to the great experience business and industry have offered teachers, the payoff with students is potentially enormous. Our task is to communicate this excitement in meaningful tasks to our students. The conference provided a giant leap toward this end."

Dale Beames, Coral Springs High School, TRAC Fellow at Idaho National Engineering Lab

Conference Agenda

Sharing Our Successes II: Changing the Face of Science and Mathematics Education Through Teacher-Focused Partnerships

October 13 - 14, 1994

Lawrence Hall of Science, U. C. Berkeley

Wednesday, October 12 (Travel Day)

Durant Hotel, 2600 Durant Ave.

4:30 - 5:00 p.m — Teacher Early Registration

5:00 - 7:00 p.m. — Reception and IISME Swap Meet for Teachers

Thursday, October 13

7:30 & 7:45 a.m. — Buses depart from Hotel Durant to LHS

Lawrence Hall of Science A-Level Information Desk

7:45 - 8:30 a.m. — Registration for Conference Participants

Auditorium

Coffee

8:30 - 8:45 a.m. — **Welcome**
Dr. Marian Diamond, Director, Lawrence Hall of Science

8:45 a.m. — **Plenary Session I: Sharing Successes: Telling our Stories, Broadening our Contexts**

8:45 - 9:15 a.m. — **Teachers Modeling Success**
Judy Young, IISME Peer Coach

Sandra Van Natta, Peer Mentor, Partners for Terrific Science

Deborah Mears, Partners for Terrific Science

9:15 - 9:45 a.m. — **Building Teacher Communities**
Dr. Milbrey McLaughlin and Dr. Joan Talbert, Stanford University

9:45 - 10:15 a.m. — **Linking SWEPs to Reform Efforts**
Tamra Busch-Johnsen, Business-Education Compact of Washington County

Dr. Roland Otto, Lawrence Berkeley Lab

Dr. Bonnie Kaiser, Rockefeller University

10:15 - 10:30 a.m. — Break

10:30 - Noon

See Roundtable Schedule for Room Assignments

Roundtables - Session I
(For Program Coordinators only)

Room 119 (Teachers with Last Name A-G); Room 150 (Last Name H-Z)

Teacher Discussions: Creating a Learning Community at Your School or Within Your SWEP
Dr. Milbrey McLaughlin and Dr. Joan Talbert, Stanford University, Facilitators

North Lawn

Noon - 1:00 p.m. Lunch (*seating for program coordinators and teachers by subject area for informal discussion*)

Room 150

1:00 - 3:30 p.m. **Program Coordinator Workshop I on DOE Program Evaluation**
Dr. Susan Loucks-Horsley, The National Center for Improving Science Education

Eileen Engel, Lawrence Berkeley Laboratory

Ampitheatre

Teacher Workshop I
Preparation for Small Group Discussions on Topics Proposed by Teachers (30 min.)

Interdiscplinary Teaching (60 min.)
Van Schoales, Bay Area Coalition of Essential Schools

Teacher Small Group Discussions (60 min.)

Auditorium Lobby

3:30 - 3:45 p.m. Break

See Roundtable Schedule

3:45 - 5:15 p.m. **Roundtables - Session II**

Plaza (Entrance to LHS)

5:30 - 7:30 p.m. Sunset Reception/Buffet on the Plaza and Entertainment

Circular Drive Near LHS Entrance

7:45 p.m. Buses depart for Durant Hotel

Friday, October 14

7:30 & 7:45 a.m. Buses depart from Hotel Durant to LHS

Auditorium

7:45 - 8:15 a.m. Coffee

8:15 a.m. **Plenary Session II**

8:15 - 8:30 a.m. **SWEP Power for the Year 2000**
Deborah Grossman, DuPont Photomasks, IISME Board of Directors

8:30 - 8:50 a.m. **The State of the SWEP Network: Where Do We Go From Here?**
Lauren Williams, Triangle Coalition for Science and Technology Education

Ampitheatre

8:50 - 10:15 a.m. Program Coordinator Session II

DOE Report on Student Outcomes (30 min.)
Dr. Jean Young, The National Center for Improving Science Education

Panel on SWEP Evaluation Efforts (55 min.)
Jay Dubner, Columbia University

Dr. Kathryn Sloane, University of California, Berkeley

Dr. Violet Rohrer, Spring Arbor College

Auditorium

Teacher Workshop II

The Grooviest Thing I Did in My Classroom Based on My Summer Experience
10-minute presentations by teachers followed by Q&A

Bob Zafran, IISME San Francisco, Emcee
Presenters To Be Introduced

10:15 - 10:30 a.m.	Break	
10:30 a.m. - Noon	**Roundtables - Session III**	**See Roundtable Schedule**
Noon - 1:00 p.m.	Lunch (*seating by region for informal discussion*)	**North Lawn**
1:00 - 2:30 p.m.	**Roundtables - Sessions IV**	**See Roundtable Schedule**
2:30 - 2:45 p.m.	Break	
2:45 - 3:30 p.m.	**Kaizen Cards, Entertainment, Closing** Science Discovery Theatre Judy Young, IISME Peer Coach	**Auditorium**
3:30 - 3:50 p.m.	Break	
4:00 p.m. (sharp)	Buses depart for IISME 10-year Anniversary Gala (UC Berkeley Campus Shuttle Buses depart for downtown Berkeley every 30 minutes)	**Circular Drive Near LHS Entrance**

Roundtable Session Schedule

Session I Thursday, October 13 10:30 a.m. - Noon (Coordinators only in this session)

Dissemination Derring-Do, Session A **Room 120C**
Facilitator: John Wilson, Gulf Coast SIFT, Stennis Space Center, MS
Recorder: Anita Cole, Washington County Business-Education Compact, Beaverton, OR

Teachers and program coordinators discuss successful methods for and challenges in disseminating classroom transfer plans and ideas to a wider teacher audience.

Nuts & Bolts: Finance and Management Issues **Stage East**
Facilitator: Stephanie Sullivan, Rhode Island Math Science Coalition
Recorder: Jerry Arnold, Interlink Consulting Inc., IISME Coos Bay, OR

Program coordinators share methods for hiring teachers as temporary employees/interns/or co-ops, successfully developing and engaging a Board of Directors, achieving fiscal stability, etc.

Skill Building for SWEPs: Fundraising and Corporate Sponsor Development, Session A **Room 145**
Facilitator: Dick French, Partners for Terrific Science, Middletown, OH
Recorder: Florine Belanger, Industry Fellows Program, San Diego, CA

Program coordinators share fundraising strategies; grantwriting tips; creative funding sources, and methods for truly engaging corporate sponsors, mentors and program champions.

TRAC Program Coordinator Session **Room 222 (B Level)**
Facilitator: Eileen Engel, Lawrence Berkeley Laboratory TRAC Program
Recorder: Nina Leonhardt, Brookhaven National Laboratory TRAC Program

A session specifically designed for DOE Teacher Research Associates Program Coordinators.

Creative Financing to Achieve Education Reform, Session A **Room 140**
Facilitator: Joanna Fox, Georgia Industrial Fellowships for Teachers, Georgia Institute of Technology
Recorder: Donna Brearly, Discovery Place, VISION-North Carolina

Share strategies for tapping into Eisenhower funds, Goals 2000 funding, School-to-Work Transition and Tech Prep programs, etc.

Session II Thursday, October 13 3:45 - 5:15 p.m.

Expanding our Audiences, Session A **Room 140**
Facilitator: Pat Moore, IISME/Educator Excellence Program, Beaverton, OR
Recorder: Judith Royer, Creating Lasting Links, Lesley College, Cambridge, MA

Share ideas for expanding teacher audiences to include K-8 teachers, pre-service teachers, students, teachers of non-technical subjects, administrators, counselors, teachers of color, and college faculty.

More Than Just a Summer Job: Education Support Services, Session A **Room 120C**
Facilitator: Jay Dubner, Columbia Summer Research Program for Secondary Science Teachers
Recorder: Doris Tucker, Cool Spring Middle School, VISION-North Carolina

Share ideas for summer and academic-year teacher support to ensure that SWEPs do more than give teachers "just a summer job."

Telecommunications for SWEPs **Ampitheatre (Stage Area)**
Facilitator: Bob Shayler, IISME San Francisco, San Leandro High School, San Leandro, CA
Recorder: Julie Ernstein, Martin Marietta Graduate Fellows Program, Baltimore, MD

Participants discuss results of recent SWEP Telecommunications Survey, their implications, and develop recommendations.

TRAC Teacher Session **Room 119**
Facilitator: Michael Thibodeau, Lawrence Berkeley Laboratory TRAC Program, Marblehead High School, Marblehead, MA
Recorder: Bernie Lefebvre, Hauppauge High School, Brookhaven National Laboratory TRAC Program

A session specifically designed for teachers in the DOE Teacher Research Associates Program.

Skill Building for SWEPs: Fundraising and Corporate Sponsor Development, Session B **Stage East**
Facilitator: Beth Snyder Jones, Martin Marietta Graduate Fellows Program, Baltimore, MD
Recorder: Henry Zot, STARS Program, University of Texas Southwestern Medical Center

Program coordinators share fundraising strategies; grantwriting tips; creative funding sources, and methods for truly engaging corporate sponsors, mentors and program champions.

PR for SWEPs, Session A **Room 222 (B Level)**
Facilitator: Mary Ann Sheline, Teacher in Industry Strategy, Grand Valley State University, Allendale, MI
Recorder: Nancy Gunter, Central Elementary School, Oak Ridge National Laboratory TRAC Program
middle

Share written materials, posters, excerpts of videotapes and other materials developed to publicize your programs and recruit teachers and sponsors.

Using Technology in the Classroom: From Graphing Calculators to Computers **Room 150**
Facilitator: Shirley Bhatt, IISME San Francisco, Concord High School, Concord, CA
Recorder: Alma Greer, New Hope High School, Oak Ridge National Laboratory TRAC Program

Discuss and observe demonstrations of the use of graphing calculators in the high school mathematics classroom; share ideas for incorporating computers and other technology into the classroom.

Session III Friday, October 14 10:30 a.m. - Noon

Dissemination Derring-Do, Session B **Room 119**
Facilitator: Tina Demirdjian, Partners in Science and Industry Program, L.A. Educational Partnership
Recorder: Donna Light-Donovan, Hostos-Lincoln Academy of Science, Rockefeller University Outreach Program

Teachers and program coordinators discuss successful methods for and challenges in disseminating classroom transfer plans and ideas to a wider teacher audience.

An Introduction to the Internet **Auditorium (Floor)**
Facilitator: Bob Shayler, IISME San Francisco, San Leandro High School San Leandro, CA
Recorder: None

Learn about the use of Internet, including how to select a service provider, how to get an E-mail address, what Internet can offer you. Note: This is not a hands-on training session .

Getting Beyond the Cubicle: How Teachers Can Enhance Their Summer Experience **Room 150**
Facilitator: Sandy Van Natta, Partners for Terrific Science, Middletown, OH
Recorder: Carl Rapp, University School; Pacific Northwest Lab, University of Rochester, and NSF Science and Technology Center Summer Research Programs

Discuss ideas and strategies for completing your summer assignment while exploring all the resources a company or university/government research laboratory has to share.

Creative Financing to Achieve Education Reform, Session B **Room 175**
Facilitator: Bill Korpa, Roseburg Area Business/Education Consortium, Roseburg, OR
Recorder: Ted Ter Haar, Teachers in Industry Strategy, Grand Valley State University, Grand Rapids, MI

Share strategies for tapping into Eisenhower funds, Goals 2000 funding, School-to-Work Transition and Tech Prep programs, etc.

Viewing of Triangle Coalition SWEPT Video **Room 222 (B Level)**
Facilitator: Lauren Williams, Triangle Coalition for Science and Technology Education, College Park, MD
Recorder: None

View portions of and comment on the Triangle Coalition for Scienceand Technology Education's new videotape promoting the concept and development of scientific work experience programs for teachers.

The Discrepancy Between Expectations and Outcomes **Ampitheatre (Stage Area)**
Facilitator: Karen Pomeranz, Teacher Release to Industry Program (TRIP), Deakin University, Burwood, Australia
Recorder: Susan DeRiemer, Meharry Medical College Outreach Program, Nashville, TN

TRIP was conceived as a major innovative professional development program for experienced teachers, with several clearly defined objectives. Several have been modified over the past four years to accommodate the reality of what is achievable. Nevertheless many impressive and unanticipated outcomes have occurred.

Linking into State Systemic Initiatives, Session A **Room 128**
Facilitator: Bonnie Kaiser, Rockefeller University Science Outreach Program, New York, NY
Recorder: Marcy Wood, Inhalation Toxicology Research Institute TRAC Program, Albuquerque, NM

Discuss strategies for linking up SWEPs to State Systemic Initiatives.

Session IV Friday, October 14 1:00 - 2:30 p.m.

Expanding our Audiences, Session B **Room 119**
Facilitator: Pamela Lucas, Princeton Plasma Physics Laboratory TRAC Program
Recorder: To be arranged

Share ideas for expanding teacher audiences to include K-8 teachers, pre-service teachers, students, teachers of non-technical subjects, administrators, counselors, teachers of color, and college faculty.

More Than Just a Summer Job: Education Support Services, Session B **Room 150**
Facilitator: Ray Hill, Lowell High School, IISME San Francisco and TRAC Program, Lawrence Berkeley Lab
Recorder: Alice Krueger, High Plains Consortium for Math and Science, Aurora, CO

Share ideas for summer and academic-year teacher support to ensure that SWEPs do more than give teachers "just a summer job."

PR for SWEPs, Session B **Room 222 (B Level)**
Facilitator: Don Beck, Florida SIFT
Recorder: Marsha Lauck, North East Middle School, Martin Marietta Graduate Fellows Program, Baltimore, MD

Share written materials, posters, excerpts of videotapes and other materials developed to publicize your programs and recruit teachers and sponsors.

Bringing Industry Practices into the Classroom **Ampitheatre**
Facilitator: Julie Dunkle, Mission San Jose High School, IISME San Francisco
Recorder: Edward Barry Gray, Clear Lake High School, Texas Teacher Internship Program

Discuss strategies for incorporating in the classroom and/or school site Total Quality Management concepts, teambuilding, group work, long-term projects, strong communication skill building, etc.

Alliances and Compacts **Room 120C**
Facilitator: Tamra Busch-Johnsen, Washington County Business-Education Compact, Beaverton, OR
Recorder: Brian Walenta, Texas Alliance for Science

Explore the role of umbrella organizations in helping to initiate, sustain and expand SWEPs.

Linking into State Systemic Initiatives, Session B **Room 128**
Facilitator: Joanna Fox, Georgia Industrial Fellowships for Teachers, Georgia Institute of Technology
Recorder: To be arranged

Discuss strategies for linking up SWEPs to State Systemic Initiatives.

SHARING OUR SUCCESSES II

October 13 - 14, 1994

Lawrence Hall of Science, University of California

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505/624-8134

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214/648-7224
email: zot@utsw.swmed.edu

PROGRAM COORDINATOR WORKSHOP I:
DOE PROGRAM EVALUATION

Susan Loucks-Horsley
Brainstorming Elements of a Successful SWEP

1. Program Administration

Clearly defined responsibilities
Adequate funding
Continuous oversight
Know who's responsible for what
Community support is evident
Communication is effective
Enthusiastic, energetic leader
Support for program staff
Team approach
Clearly defined milestones
Schedule - before, during, after
Checklist
Orientation Manual for teachers and mentors
Procedure for rotating teachers
Board of advisors
Administrative input from teachers and mentors
Participant involvement in project planning and revision
Timely dissemination of information - includes sharing between programs
Sensitivity to teacher needs
Availability
Linking teachers to resources
Maintain database of teacher information
Ensure sustainability
Foster professionalism in teachers
Foster organizational professionalism
Effective use of Advisory Board / Steering Committee

2. Teacher Assignments

A perfect marriage between teacher and mentor
Area of interest
Skills match
Appropriate project for time
Capable mentors
Transferable experience to classroom
Growth experience/opportunity for professional expansion
Value teacher's role
Ongoing support for teachers
Realistic, clearly defined expectations for teachers and mentors
Meaningful, productive work
Match program goals
Mechanism for adjustment (early feedback of mentors and teachers)
Mentor training
Interview before selection (fellow and program)

Objective selection criteria
- portfolio of experience / record (share with other teachers)
- balance between mentor and teacher (mentors learn from teachers - symbiotic)

Begin developing teacher networks during summer
Identifying project in advance (teacher and mentor)

3. Preparation

Teacher-mentor contact
Administrative contact with teacher (pre-assignment, paperwork, payroll, drug test, clearance)
Orientation: teacher and mentor
Pre-site reading material
Lab techniques
Specialized training
Peer sharing opportunities (returnees, email)
Poster sessions for "old" and "new"
Visits by hosts to teacher classrooms in advance and vice versa
Goals/expectations/criteria clearly communicated to both partners
Community orientation
Suggested readings
Resume workshop
Personal support for teachers
LOTS of lead time
Question hotline
Prepare ID, parking, clearance, housing, space
Learning curve (adapting to environment)
Pre-qualifications
Address differences between education and industry
Orient to language/customs/workplace ethics/norms
Pay scale
Possible workplace resentment in companies which have experienced downsizing?

4. Teachers' Research Experience

Committed mentor
Clear assignment
Good preparation/planning
Area of interest to teacher
Appropriate background experience (education) - Match content knowledge and research
Close monitoring of experience
Significant research experience
Mentor back-up person (day-to-day)
Appropriate length of time
Reading of scientist's papers
Teacher's sharing with peers during experience
Opportunity for creativity
Hands-on
Variety/completeness of exposures
Feedback validation
Ongoing support for transfer of experience to classroom and beyond
Opportunity to present and publish
School recognition for experience

"Team" support
Comfort with computers, statistical methods and information retrieval
Build success in project
Formal/informal opportunity to share what learned
Teacher logs/journals
Positive reinforcement for teacher of program

5. Broader, Lab-Related Experiences

Seminars for participants
Identify educational resources at worksite
Flexibility/adaptability
Big picture relevance
Integrate disciplines
Transfer to classroom/school/district
Ongoing contact to mentor
Meet with Human Resources person
Returning teacher as peer coach to access resources
Facilitate site visits with teachers, administrators and students
Technical training
Inter-lab experiences
Bringing students into workplace
Bring lab and mentor to the students
Computer networking
Sharing with non-participating colleagues
Exposure to other opportunities
In-house publicity
Participation in in-house development

6. Follow Up

Exit interview
Solicit suggestions for next year
Transfer - Communication
Principal / superintendent / county superintendent letter
Coordinators visit teachers in class
Internet
Reunion / posters / activities
Maintain site contact - field trips, guest speakers
Newsletter
Survey teacher / business / parents
Thank you letters
PD network
Press releases
Mentoring colleagues
Pulling more resources into classroom
Follow-up sessions designed by teachers
Symposia
Yearbook
Small grants for teachers (travel/material/supplies)
Follow-up surveys for both parties
Certificates of recognition - School Board

Conferences / business-sponsored seminars
Field trips back to worksite
Regular meetings
Networking among mentors/teachers
PR - public, corporation, school district
Displays at industries of student work
Gifts/plaques to industry
Tracking the teachers - what happens to them?
Community application

7. Program Evaluation

Goals and objectives which are measurable
Evaluate "all" participants
Evaluation form(s) for teacher and mentor
Follow-up meeting for mentors to de-brief
Executive program summary for all participants
Student assessment in class (pre and post)
Experimental design with control group
Short-, mid- and long-term follow-up
Evaluate the evaluation instrument
Identify skills to be gained with student outcomes
Cross reference with other programs
Continued funding and participation
Weekly evaluations
Observations
Follow-up evaluation of impact in classroom
Retention survey
Spring implementation survey (were teachers successful?)
Matrix of activity near-, mid-, long-term
Advisory committees / focus groups with all parties involved
Assess systemic integration into curriculum
Site visits
Brainstorming for next year
Structured interviews

Appendix D

The National Center for Improving Science Education

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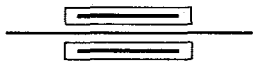
Directory of Scientific Work Experience Programs for Teachers

October 1994

Directory of Scientific Work Experience Programs for Teachers



October 1994

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Grateful acknowledgement to TRW for printing this document.

Directory of Scientific Work Experience Programs for Teachers

Introduction

This Directory contains information about the 91 known scientific work experience programs (SWEPs) for teachers currently operating in the U.S. The features of each program vary, but all of them offer mathematics and science teachers paid internships in a company, university research laboratory, or government laboratory.

The National Science Foundation (Grant #TPE-9154551) supports the publication of this Directory by Industry Initiatives for Science and Math Education (IISME) San Francisco Bay Area. IISME first conducted a survey of all known SWEPs during the summer of 1992 and published the first version of this Directory in September 1992. In February, 1994 IISME began collecting information for this second Directory. Program managers received an initial entry to complete, with follow-up postcards and phone calls as needed to clarify data or remind program directors to submit information. All programs listed in this Directory eventually submitted data, although not all furnished complete information. About a dozen additional programs elected not to be listed in the Directory because they were too small, not ongoing, or sponsored at only one company site. Data from those programs are not included in the summary that follows.

The following profile summarizes the various features of the 91 SWEPs which provided detailed information.

Number of Teachers Served

SWEPs served 1,546 math, science, and technology teachers in the summer of 1993. Although the number of internships offered is much higher (due to repeat participation in some programs by individual teachers), SWEPs have served an estimated total of 5,500 teachers since their inception.

Geographic Representation

As of last summer, teachers could participate in SWEPs in 40 states and in the District of Columbia. Some states offer teachers a variety of programs in different locations (e.g., California lists 11 programs serving much of the state). However, most states typically have one or two programs. The U.S. Department of Energy TRAC program and most multisite programs recruit teachers nationally, as do a few single-site SWEPs.

Number of Students Reached

Assuming teachers reach 200 students per year, the teachers who have participated in SWEPs in 1993 will reach 309,000 students each year with new ideas and teaching techniques transferred from the teachers' industry and research laboratory experience. Assuming all 5,500 teachers served by SWEPs have stayed in teaching, they will reach approximately 1.1 million students annually.

Average Age and Size of Programs

The average SWEP has been in existence for 3.4 years. The oldest known project, Cleveland's Teacher Internship Program, has operated for 15 years. The New Jersey BISEC Teacher Improve-

ment Project, established in 1983, and IISME San Francisco, beginning its tenth summer in 1994, were the second and third programs to be established. Thirty-three programs (39%) are three years old or less.

Many SWEPs are quite small. SWEPs served on average 18 teachers in 1993. Thirty-one programs (36%) placed fewer than ten teachers that year. The largest programs are multi-site: the U.S. Department of Energy Teacher Research Associates (TRAC) program with 336 participants at 28 government research laboratories; and the Research Corporation's Partners in Science program with 112 teachers at 14 universities. Oregon's IISME/Educator Excellence Program in Portland is the largest single-site program, with 100 teachers in 1993.

Program Funding

Seventy-two SWEPs gave out $6.3 million in teacher stipends in 1993 (an average of more than $4,000 per teacher participant). All 91 SWEPs paid approximately $7.4 million in stipends that year. This figure does not include additional funds given by many programs for travel, housing, classroom supplies, and tuition reimbursement. Sponsors of the 72 programs providing data also paid $1.6 million to support operational costs and academic-year follow-up with participants. In total, a conservative estimate of the funds that supported teacher stipends and operational costs, and teacher support of all 91 SWEPs in 1993 exceeded $9 million.

Industry and Business Participation

An estimated 454 separate companies and businesses (including hospitals, banks, industry associations, Chambers of Commerce, etc.) participated in SWEPs in 1993 by hosting teachers, donating money, or both.

University and College Participation

Approximately 180 universities and colleges participated in SWEPs, by hosting teachers in their research laboratories and/or by assisting teachers to translate their experience to the classroom via the educational component of the programs. Almost all programs offer some education component to participating teachers. Many offer college credit to participants.

Federal Government Participation

Several branches of the federal government actively support SWEPs. Thirty programs (including 28 TRAC programs) receive total or partial support from the U.S. Department of Energy and ten reported funding from the National Science Foundation. Seven programs receive state funding (typically from state Departments of Education) and five are supported by a local NASA site. Four programs are funded by the National Institutes of Health. Three receive Dwight D. Eisenhower Math and Science Education Program (Title II) funding. In addition, 12 programs receive funding from other federal government entities, including the U.S. Department of Education, U.S. Department of Defense, U.S. Food and Drug Administration, the Environmental Protection Agency, the U.S. Bureau of Mines, and local military bases.

Long-term SWEP Survival

Fourteen of the 84 programs listed in the 1992 Directory are no longer in existence. Some have lost their funding or local champion, others have refocused their resources on other professional development activities for teachers, and others have merged. Since this Directory lists 91

programs, it appears that new SWEPs have been created at a slightly higher rate than other SWEPs have gone out of existence.

Programs no longer in existence are listed in this Directory, beginning on page 38. This will serve to assist others in the same geographic area who may wish to initiate a new program.

International SWEPs

We are aware of two programs in other countries that offer teachers scientific work experience. These programs are listed on page 36.

To make changes, additions, or corrections to this Directory, please call, write, or fax: Kaye Storm, Director of Special Projects, IISME, 1636 Madrono Avenue, Palo Alto, CA 94306-1017, tel. 415/326-4800, fax 415/326-4880.

About IISME

Industry Initiatives for Science and Math Education (IISME) was founded in 1985 by a consortium of San Francisco Bay Area industries in partnership with the Lawrence Hall of Science at the University of California at Berkeley.

IISME's founders hoped to address the critical need for a strong, highly-skilled workforce in mathematics, science, and technological fields. This industry-education partnership focuses on **teachers** as the primary agents for effecting meaningful change in mathematics and science education.

IISME's core program, the **Summer Fellowship** program, makes it possible for teachers of science, mathematics, and computer science (at the high school and middle school level) to gain first-hand experience in applied research and other industry environments for eight weeks during the summer. Teachers are paired with industry mentors and earn $700 a week. The Lawrence Hall of Science office of IISME provides year-round assistance to teachers as they strive to translate the summer experience into updated and enriched classroom instruction.

IISME is a mature collaborative with a measurably successful track record. In the first ten years of the program, over 70 businesses and government laboratories have offered 763 summer fellowships to teachers in the seven-county Bay Area. The 440 teachers who have received these fellowships represent over 20 percent of the Bay Area high school science and mathematics teaching force and a smaller proportion of middle school teachers.

In total, IISME's corporate and foundation sponsors have contributed $6.5 million and 30,000 volunteer hours to improve mathematics and science education in the Bay Area through the auspices of the IISME program.

In recognition of IISME's success, the National Science Foundation, the U.S. Department of Energy, and the William Randolph Hearst Foundation provided significant funding for IISME to help launch 25 other IISME-like programs through the U.S. In October 1991, IISME convened the first-ever conference for program managers and teacher participants from all the scientific work experience programs around the country. A second conference is planned for October 1994.

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Alabama			
Huntsville Industry Initiatives for Science and Math Education (HIISME)	Huntsville/ Madison County	1993 7 7 1992 9 8 1991 7 5	AVEX, Boeing, The Chamber of Commerce of Huntsville/ Madison County, Coleman Research, Martin Marietta,PRC, SCI Systems, TRW
California			
High School Teacher Summer Program (HST)	Pasadena	1993 12 1992 12 1 (All positions are at Jet Propulsion Laboratory.)	Jet Propulsion Laboratory
Industry Fellows Program	San Diego County	1993 13 12 1992 16 1 1991 4 4 1990 18 9 1989 16 10 1988 13 13 1987 21 16 1986 10 9 Total participants: 111	Advanced Tissue Sciences, Alliance Pharmaceuticals, General Dynamics/Convair, GEN-PROBE, Gensia Pharmaceuticals, Hewlett-Packard, Hybritech, Institute for Molecular Studies, Kelco Division of Merck, Tanabe Research, UNISYS
Industry Initiatives for Science and Math Education (IISME) Sacramento	Sacramento Area	1993 11 6 1992 11 6 1991 11 6 1990 8 N. A. 1989 7 N. A.	Hewlett-Packard, IBM, McClellan Air Force Base, Northern Telecom, Pacific Bell, Pacific Gas & Electric, Sacramento Municipal Utility District
Industry Initiatives for Science and Math Education (IISME) San Francisco Bay Area	7 counties of San Francisco Bay Area	1993 76 29 1992 85 27 1991 100 22 1990 78 20 1989 71 22 1988 72 21 1987 73 20 1986 88 30 1985 44 14 Total participants: 404	COMPANIES/CORPORATE FOUNDATIONS: AT&T, Advanced Micro Devices, Alexian Brothers Hospital, Alza, Amdahl, Apple Computer, Applied Biosystems, Broderbund Software, Brown & Caldwell, Calif. Biotechnology, Canon Research, Cetus, Chevron, Clorox Foundation, Collagen, Deskin Research Group, Dow Chemical, Dupont, EG&G, ESL, Eaton, El Camino Hospital, FMC, Ford Aerospace, Genentech, General Electric, GTE Government Systems, Hewlett-Packard, IBM, ICI Americas, Intel, Intersil, Kaiser Aluminum & Chemical, Kaiser Permanente, Lifescan, Litton-Applied Technology, Lockheed Missiles & Space, Maxtor, Metropolitan Life Insurance, NEC Electronics, Nellcor, Northern Telecom, Pacific Gas & Electric, Pacific Bell, Pacific Telesis Foundation, Plantronics, Quantum, Raychem, Raynet, Raytheon, Rolm Systems, Safeway Stores, Sandoz, Schlage Lock, Scios Nova, Silicon Graphics, Synoptics, Syntex, Tandem Computers, Telebit, Triton Biosciences, United Technologies, Unisys, Watkins-Johnson, Westinghouse, Xerox, Zenger-Miller PRIVATE FOUNDATIONS: California Engineering Foundation, Hearst Foundation GOVERNMENT/GOV'T. LABS: Department of Energy, Lawrence Livermore National Lab, NASA-Ames, National Science Foundation, Sandia National Labs OTHER: Triangle Coalition for Science and Technology Education, Women in Technology

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $600/week, 6-8 weeks Sponsor Fee: None	Teachers develop an Action Plan. No college credit available.	Education Officer from NASA Marshall Space Flight Center serves as IISME Chair.	Bob Sampson Huntsville/Madison County Chamber of Commerce P.O. Box 408 Huntsville, AL 35804-0408 205/535-2033 FAX 205/535-2015
Information N.A.		The program for local public high school teacher includes work experience, tours, and lectures.	Monica Garcia Professional Development (605-101) 4800 Oak Grove Drive Pasadena, CA 91109-8099 818/354-3752
Stipend: $4800/8 weeks Sponsor Fee: $700	IFP is not affiliated with a university; college credit is available through UC San Diego. Teachers develop Action Plans.	Math, science and computer technology teacher emphasis, but will place other disciplines if company has additional needs	Florine Belanger San Diego County Office of Education 6401 Linda Vista Road Room 407 San Diego, CA 92111-7399 619/292-3850 FAX 619/569-7851
Stipend: $625/week Sponsor Fee: $850/ summer	California State University-Sacramento Weekly meeting with School of Education Faculty during the work assignment; 3 follow-up meetings during the academic year College credit is available.	Have mechanism to place teachers at local air force base.	Oliver Sasse P.O. Box 310 Roseville, CA 95661 916/784-1624
Stipend: $5600/8 weeks Sponsor fee: $2200 (teachers hired on company payroll); $3000 (teachers hired on IISME payroll)	Lawrence Hall of Science at University of California, Berkeley provides educational component. No college credit available. Teachers develop an Action Plan and participate in IISME Academy workshops during the academic year; IISME-NET computer network; Fund for Innovation small grants for teachers.	IISME has helped launch 24 sister programs across the country with replication funding from NSF, DOE, Hearst Foundation, and the Triangle Coalition for Science and Technology Education. Program collaborates with the Partners in Science Program (see under multisite programs).	Marie L. Earl c/o Deskin Research Group 2270 Agnew Road Santa Clara, CA 95054 408/496-5340 FAX 408/496-5333 mearl@ctp.org or Karin Rosman Lawrence Hall of Science U.C. Berkeley Berkeley, CA 94720 510/643-6594 FAX 510/642-1055 krosman@igc.apc.org

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
California (cont'd)			
IISME VISION	San Francisco Bay Area	1993 22 3 1992 23 3 Total all previous years: 33	COMPANIES: Advanced Micro Devices, Amdahl, Applied Materials, AT&T Network Systems, Canon Research Center America, General Electric, Hewlett-Packard, Hitachi Data Systems, IBM, Intel, Kaiser Permanente, Lockheed Missiles and Space, Measurex, National Semiconductor, Philips Semiconductor, Raytheon, ROLM, Syntex, Tandem Computers, Westinghouse Electric FOUNDATIONS: Intel Foundation, SRC Education Alliance OTHER: School districts
Partners in Science and Industry Fellowships	Los Angeles Unified Schools	1993 21 1992 25 1991 38 1990 35 1989 25 1988 17 1987 7 Total participants: 150	Aerospace Corp., California State University of Los Angeles, Department Water Project, GTE, IBM, Kendall-McCaw, National Medical Enterprises, Northrop, Pacific Bell, Stolte, University of California-Los Angeles, University of Southern California (partial list)
Summer Research Internship Program (SRIP)	San Francisco Bay Area, Central Valley, Sacramento	1993 37 1992 33 1991 20 1990 5 Total participants: 95 (All positions are at Lawrence Livermore National Lab.)	Department of Energy
Teacher in the Workplace	Solano County	1994 is first year.	Alza, Clorox, Kaiser Permanente Medical Center
Teacher Research Associates (TRAC)	Berkeley (Teachers recruited nationally.)	1993 40 1992 39 (All positions are at Lawrence Berkeley Laboratory.)	Department of Energy
Teacher Research Associates (TRAC)	Livermore (Teachers recruited nationally.)	1993 11 1992 8 (All positions are at Lawrence Livermore National Laboratory.)	Department of Energy
Teacher Research Associates (TRAC)	Livermore (Teachers recruited nationally.)	1993 6 1992 11 (All positions are at Sandia National Laboratories.)	Department of Energy

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Teachers receive a minigrant of $200 upon completion of program.	Lawrence Hall of Science, U.C. Berkeley Teachers develop an Action Plan for classroom transfer.	IISME VISION transformed a summer program for high school teachers into an academic-year model for K-12 math and science teachers in 1993. Teachers spend 6 days visiting companies, receiving hands-on training and exposure to the industry environment and industry ideas. School districts provide $500 per teacher and 6 release days.	Kaye Storm 1636 Madrono Avenue Palo Alto, CA 94306-1017 415/326-4800 FAX 415/326-4880
Stipend: $500/week Sponsor Fee: $1000 Curriculum grants of $150 per teacher are available.	IISME-LA is not affiliated with a university. District salary credit available. IISME Academy operates during the school year.	IISME-LA is administered by the Los Angeles Education Partnership which sponsors a wide range of activities for K-12 teachers. Have mechanism to place teachers from year-round schools.	Pat Dung LAEP 315 W. Ninth St. Suite 1110 Los Angeles, CA 90015 213/622-5237 FAX 213/629-5288
Stipend: $3555/12 weeks.	Sonoma State University Teachers are encouraged to develop hands-on and resource materials.	The lab loans materials, modules, and equipment and distributes a quarterly newsletter.	Eileen S. Vergino Lawrence Livermore National Lab. P.O. Box 808, L-793 Livermore, CA 94550 510/424-0567 FAX 510/373-0142 verginoes@llnl.gov
Stipend: $700/ week for 4 weeks. No sponsor fee.	Teachers receive workshops on communication, collaboration, leadership, and coaching skills.		Margo McGlone Solano County Business & Education Alliance Golden Hills School 2460 Clay Bank Road Fairfield, CA 94533
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multi-site programs).	Eileen Engel Lawrence Berkeley Laboratory 1 Cyclotron Road MS 90-1070 Berkeley, CA 94720 510/486-5719 FAX 510/486-6660
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities	This is part of the nationwide TRAC program (see under multi-site programs).	Janice M. Gogel Lawrence Livermore National Laboratory P.O. Box 808, L-728 Livermore, CA 94550 510/422-4842
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multi-site programs).	Brenda S. McFarland Personnel Division 8522 Sandia National Laboratories P.O. Box 969 Livermore, CA 94551-0969 510/294-3371 FAX 510/294-3524

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
California (cont'd)			
Teachers Research Associates (TRAC)	Stanford (Teachers recruited nationally.)	1993 6 1992 2 (All positions are at Stanford Linear Accelerator Center.)	Department of Energy
Colorado			
Colorado Alliance for Science Summer Fellowship Program	State of Colorado	1993 48 27 1992 41 24 1991 31 25 1990 8 8 1989 9 9 Total participants: 137	COMPANIES: Abel Engineering, Adolph Coors, AMOCO Production, Botanic Gardens, Boulder Technology Incubator, Children's Hospital, Children's Museum, Colorado Beef Council, Denver Museum of Natural History, Display Tech Inc., EG&G Rocky Flats, Federal Express, Gates Rubber Co., Hach Co., Hewlett-Packard, LexMark, IBM, Kodak, NCR, Penrose Hospital, Public Service, Spectranetics, Storagetek, Sundstrand, West Star Aviation FOUNDATIONS: Anschutz Foundation, Bonfils-Stanton Foundation, Gates Foundation GOVERNMENT AND GOVERNMENT LABS: Food and Drug Administration, National Center for Atmospheric Research, National Institute of Standards and Technologies, National Oceanic and Atmospheric Administration, National Renewable Energy Lab UNIVERSITIES: Adams State College, Fort Lewis College, Colorado School of Mines, Colorado State University, Regis University, University of Colorado-Boulder, University of Colorado-Colorado Springs, University of Colorado-Denver, University of Colorado Health Sciences Center, University of Denver
Teacher Research Associates (TRAC)	Golden (Denver area) (Teachers recruited nationally.)	1993 1 1992 9 (All positions are at National Renewable Energy Laboratory.) Total participants: 30	Department of Energy
Teacher Research Associates (TRAC)	Golden (Denver area) (Teachers recruited nationally.)	1993 3 1992 4 (All positions are at Rocky Flats Plant.)	Department of Energy
Connecticut			
CBIA Fellowship Program for Distinguished Teachers	State of Connecticut	1993 15 9 1992 21 15 Total participants: 278	American Cyanamid, Boehringer Ingelheim Pharmaceuticals, Canberra Industries, Connecticut Business and Industry Association, Interplex Electronics, Olin Corp., Otis Elevator, People's Bank, Pfizer, SNET, Spirol International, Springborn Laboratories, Stanley/Bostitch, Stanley Magic Door, United Illuminating

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/ 8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs).	P.A. Moore SLAC P.O. Box 4349, MS 81 Stanford, CA 94309 415/926-3826 FAX 415/926-2525 xanadu@slac.stanford.edu
Stipend: $500/week, 8 weeks Sponsor Fee: None*	University of Northern Colorado and Colorado University, Boulder College credit is available. Teachers submit performance papers, attend an orientation, a mid-summer review, and a post-fellowship meeting.	Special effort to recruit elementary and middle school teachers. *Foundation funding enables program to place teachers at no cost to company/university in its first year of participation; at half cost in year two. Sponsors pay full stipend in third year and thereafter. Program collaborates with the Partners in Science Program (see under multisite programs).	Lesa Morris Colorado Alliance For Science Campus Box 456 University of Colorado Boulder, CO 80309-0456 303/492-6392 FAX 303/492-3400 morrislg@spot.colorado.edu
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/ 8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities	This is part of the nationwide TRAC program (see under multisite programs).	Linda Lung Education Programs National Renewable Energy Lab 1617 Cole Boulevard Golden, CO 80401-3393 303/231-7044 FAX 303/231-1006 lungl@tcplink.nrel.gov
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/ 8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs).	Eileen A. Jemison Education Outreach EG&G Rocky Flats Rocky Flats Plant P. O. Box 464 Golden, CO 80402-0464 303/966-2302 FAX 303/966-6153
Stipend: $550/week Total sponsor cost: $5500	No educational component or academic year activities. No college credit.		Jennifer Baker Connecticut Business and Industry Association 370 Asylum Street Hartford, CT 06103-2022 203/244-1900 FAX 203/278-8562

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Delaware			
Summer Employment Experience (SEE) Program	State of Delaware & Salem County, NJ	1993 15 6 1992 17 N.A. 1991 21 N.A. 1990 5 N.A. Total participants: 34	COMPANIES: Artesian Laboratories, Delmarva Power, Diamond State Telephone, DuPont, Hercules, ICI Zeneca, Intervet Inc., MBNA Americas, Hewlett-Packard OTHER: Christina School District, Junior Achievement
District of Columbia			
Technology Networking for Teachers (TNT)	Washington, D.C.	1993 50 1992 14 1991 15 1990 12 Total all previous years: 77 (All positions are at George Washington University.)	George Washington University, Department of Defense
Florida			
Florida Summer Industrial Fellowships for Teachers (SIFT)	N.A.	1993 27 13 1992 30 14 1991 27 15 Total participants: 70	COMPANIES: Boeing, Bionetics, Collins, Computer Sciences, EG&G, Florida Solar Energy, Grumman, Harris, Johnson Controls World Services, Lockheed, McDonnell Douglas, Raytheon, Rocketdyne, USBI GOVERNMENT: Florida Department of Education (Florida Teacher Quest Program)
Teacher Research Experience Update (TRUE)	N.A.	1993 10 1 1992 6 1 1991 4 1	National Institutes of Health
Georgia			
Georgia Industrial Fellowships for Teachers (GIFT)	Metropolitan Atlanta, Middle GA, and selected other sites	1993 58 36 1992 46 14 1991 17 8 Total participants: 90	COMPANIES/CORPORATE FOUNDATIONS: Amdahl, Apple Computer, BellSouth Telecommunications, CIBA Vision, DCA, EduQuest, Equifax Inc., Georgia Power, Georgia Pacific, Gwinnett Hospital System, Holiday Inn, Institute of Paper Science and Technology, MCI Telecommunications, NationsBanc Services, Northern Telecom, Peachtree Corners, Robinson-Humphrey, Saint Joseph's Hospital, Scientific-Atlanta, Technology Park/Atlanta, The Coca-Cola Company/The Coca-Cola Foundation, The Medical Care Center of Central Georgia, The Trane Company, Wachovia Bank of Georgia GOVERNMENT/GOV'T LABS: Eisenhower Program (Title I), National Science Foundation, Southern Regional Education Board UNIVERSITIES: Emory University and Howard Hughes Initiative of Emory University, Georgia Institute of Technology, Mercer School of Engineering

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $600/week Fee: N. A.	Teachers develop an Action Plan (classroom application). Teachers earn in-service credit with the Department of Public Instruction.	Junior Achievement of Delaware operated an internship program for economics and social studies teachers. The Science Alliance began a program for science and math teachers and the two programs merged in 1991.	Douglas Hill 1901 S. College Ave. Newark, DE 19702-2385 302/454-2425 FAX 302/454-2424
Stipend: $3000; Tuition and fees provided by DOD.	George Washington University Teachers attend a three-credit course before their summer internships. College credit is available.	This program operates as one of GWU's Science and Engineering Apprentice Programs.	Marilyn Krupsaw George Washington University School of Engineering and Applied Science 707 22nd Street, NW Staughton Hall 103 Washington, D.C. 20052 202/994-2234 FAX 202/994-6245
Stipend: $600/week for 8 weeks Sponsor fee: $200/week	Workshops, formal teacher presentations, evaluation surveys	Many of the participating companies are involved with NASA/Space Shuttle Program. The Superintendent of Schools and members of the school board visit work sites. Presentations are made before industry executives, school administration, and at school board meetings.	Don Beck 817 Dixon Blvd. Suite 14B Cocoa, FL 32933 407/631-5051 FAX 407/631-3182
Stipend: $500/week for 7 weeks.	University of Florida, Gainesville	TRUE is one of many programs offered by the Florida Foundation for Future Scientists. Teachers are housed in a dormitory with residential staff and students. Teachers are inspired by working and living with highly motivated, gifted science students.	Deborah E. Paulin FFFS 111 Norman Hall University of Florida P.O. Box 117035 Gainesville, FL 32611-7035 904/392-2310 FAX 904/392-2344
Stipend: $5000/8 weeks Sponsor fee: $2200	Emory University, Georgia Institute of Technology, Georgia State University, Mercer Macon Fellows develop Action Plan for school year implementation and attend Academy meetings during the academic year. Staff development credit is available.	Program for high school and middle school teachers. Middle grades component is part of Georgia's Statewide Systemic Initiative.	Joanna Homig-Fox Georgia Institute of Technology GIFT CEISMIC Atlanta, GA 30332-0282 404/894-9544 FAX 404/894-9675 jfox@cosdean.courier.gatech.edu

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Hawaii			
Project RESEARCH III	Oahu	1993 7 1992 5 1991 6 1990 5 (All positions are at University of Hawaii research labs.) Total participants: 19	Hawaii State Department of Education
Idaho			
Teacher Research Associates (TRAC)	Idaho Falls (Teachers recruited nationally.)	1993 13 1992 13	Department of Energy
Illinois			
Teacher Research Associates (TRAC)	Chicago area (Teachers recruited nationally.)	1993 32 1992 38 (All positions are at Argonne National Laboratory.)	Department of Energy
Teacher Research Associates (TRAC)	Chicago area (Teachers recruited nationally.)	1993 13 1992 14 1991 26 (All positions are at Fermi National Accelerator Laboratory.)	Department of Energy
Iowa			
Teacher Research Associates (TRAC)	State of Iowa (Teachers recruited nationally.)	1993 8 1992 7 (All positions are at Ames Laboratory.) Total participants: 20	Department of Energy
Kansas			
Teacher/Business Network	Sedgwick County	1993 6 N.A. 1992 19	WI/SE Partnership for Growth

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $1700 per summer plus $500 for classroom supplies. Mentor receives $500 to defray program costs. Sponsor cost: $2200	University of Hawaii-Manoa Preliminary report (at end of first summer) and final report, equivalent to an Action Plan, are presented. Mentors often visit teachers' classroom during academic year. No college credit available.		Arnold Feldman University of Hawaii at Manoa Physics Dept. 2505 Correa Road Honolulu, HI 96822 808/956-7599 FAX 808/956-7107 feldman@uhhepg
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs).	Julene Messick INEL Office of Academic Programs EG&G Idaho, Inc. Energy Research Office Bldg. 2525 Fremont Avenue MS 3810 Idaho Falls, ID 83415-3810 208/526-0318
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs).	Louis Harnisch Argonne National Laboratory Division of Educational Programs 9700 S. Cass Ave. Bldg. 223 Argonne, IL 60439 708/252-6925 FAX 708/252-3193
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Aurora University Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities. 4.5 graduate credits are available.	This is part of the nationwide TRAC program (see under multisite programs).	Kristin Ciesemier Fermi National Accelerator Laboratory Box 500, M/S 777 Batavia, IL 60510 708/840-3092 FAX 708/840-8248 ciesmier@fnalv.fnal.gov
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Iowa State University Science seminar during research component focuses on integrating research experience into classroom teaching and explores current trends/issues in science education. College credit is available.	This is part of the nationwide TRAC program (see under multisite programs)	Chris Ohana Educational Coordinator Ames Laboratory 105 Spedding Iowa State University Ames, IA 50011 515/294-4294 FAX 515/294-3058 ohana@ameslab.gov
Information N.A.	Witchita Sate	Serves K-12 teachers of all subjects in pilot 2-week-in-business model. Est. 25-50 teachers in 1994.	Linda LeFebre BEST 350 W. Douglas Wichita, KS 67202 316/268-1127 FAX 316/265-7502

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Louisiana			
New Orleans Metropolitan Summer Industrial Fellowships for Teachers (SIFT)	New Orleans and surrounding parishes	1993 N.A. N.A. 1992 23 1991 11	American Cyanamid, Boeing Petroleum Services, Computer Sciences Corp., Martin Marietta Manned Space Systems, Mobil Oil, Slidell Memorial Hospital, USDA Research Center, Shell Offshore
Massachusetts			
Math English Science Technology Eduation Project (MESTEP)	Statewide	1993 21 11 1992 21 11 1991 24 12 1990 22 11	COMPANIES: Bank of Boston, Bull Information Systems, CELT, Hewlett-Packard, Millpore, New England Telephone/ NYNEX GOVERNMENT: Dwight D. Eisenhower Math and Science Education Program (TItle II) UNIVERSITIES: University of Massachusetts at Amherst OTHER: Boston Private Industry Council, Massachusetts High Technology Council, WGBH Educational Foundation
Teacher Research Associates (TRAC)	Cambridge (Teachers recruited nationally.)	1993 4 1992 3 (All positions are at Massachusetts Institute of Technology.)	Department of Energy
Michigan			
Business Fellowship Program	Jackson County, MI	1993 9 9 1992 10 9 1991 7 5	Participating businesses, Spring Arbor College, Jackson Area Chamber of Commerce
Michigan Industrial Initiatives for Science and Math Education (MIISME)	Southeastern Michigan (Detroit area)	1993 14 6 1992 14 9 1991 14 6 1990 16 6 1989 20 7	Dow Chemical, Eaton, Ford Motor Co., ITT, Lear Seating, MASCO, Michigan Consolidated Gas, United Technologies
Teachers in Industry Strategy [formerly RET-E3 (Recognize Exemplary Teachers - Expand, Enlist, Extend)]	West Michigan	1993 19 12 1992 14 10 1991 12 7 1990 13 9 1989 12 11	COMPANIES: Amway, Acutex, BASF, Cascade Engineering, CPC-Grand Rapids Metal (GM), DLP, Gentex, Herman-Miller, Lacks Enterprises, Oliver Products, Parke-Davis, Planters Lifesavers, Prince Corp., Smiths Industries, Steelcase GOVERNMENT: National Science Foundation UNIVERSITIES: Hope College

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $530/week; 8+ weeks	No university is affiliated. No college credit available	Staff and program costs funded by Martin Marietta Manned Space Systems.	Cheryl Alexander Martin Marietta Manned Space Systems P.O. Box 29304 New Orleans, LA 70189 504/257-4665 FAX 504/257-0455
Total stipend for 15-month program: $7,000- 12,000 Sponsor fee for summer internship: $1475	University of Massachusetts at Amherst	MESTEP is a collaborative program between the university, public schools and private corporations and provides solid professional preparation in math, English and the sciences. The 15-month program entails courses leading to a Master's degree in Education and teaching certification; a semester of paid teaching and curriculum development in a public school; and a paid internship with a private corporation in the Boston area.	Richard J. Clark MESTEP School of Education 16 Furcolo Hall University of Massachusetts Amherst, MA 01003 413/545-1574 FAX 413/545-2879 rclark@educ.umass.edu
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs).	Jean Flanagan M. I. T. Massachusetts Laboratory for Nuclear Science 77 Massachusetts Avenue Cambridge, MA 02139 617/258-5447 FAX 617/253-0111
Stipend: $2000/6 weeks Sponsor fee: $1000	Spring Arbor College Weekly 4-hour seminar; lesson plan and curriculum development; portfolio assessment; follow-up field trips for students to teacher work site; business/industry personnel visit classrooms	All teacher fellows visit each site during summer.	Violet Rohrer Department of Continuing Studies Spring Arbor College Spring Arbor, MI 49283 517/750-6368 FAX 517/750-1604
Stipend: $3000/6 weeks Sponsor fee: $1050	Michigan State University MIISME Fellows develop a Technology Learning Module. College credit is available.		Clarence H. Suelter Division of Science Education 210 North Kedzie Hall Michigan State University East Lansing, MI 48824 517/336-1490 FAX 517/336-2175 suelter@msu.edu
Stipend: $500/week, 8-10 weeks Sponsor fee: $50/week	Grand Valley State University Classroom Activities Manual *Teachers in Industry: Science and Math Activities* is available through Teachers in Industry Inservice Workshops held at industry sites. College credit available to teachers who take an accompanying seminar.	Developed a component to bring K-12 administrators into the program. Program will adapt industry training strategies to schools.	Mary Ann Sheline Grand Valley State University 103 Loutit Hall Allendale, MI 49401 616/895-2265 FAX 616/895-3412 shelinem@gusu.edu

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Mississippi			
Summer Industrial Fellowships for Gulf Coast Teachers (SIFT)	Hancock, Harrison, Pearl River and Jackson Counties	1993 9 5 1992 13 7 1991 17 8	Mississippi Gulf Coast Economic Development Council, NASA, Naval Oceanography Command
Missouri			
Distinguished Teachers Fellowship Program	Greater Kansas City	1993 11 10 1992 22 N.A. 1991 26 1990 16 1989 11 Total participants: 86	COMPANIES: Allied Signal, American Cable Vision, Ash Grove Cement, Black and Veatch Engineering, Blue Cross/Blue Shield, Burlington Nothern Railroad, Butler Manufacturing, Creative Courseware, DST, Ellerbe Becket Architects, Federal Reserve Bank, Hallmark Cards, Halldex, IBM, Independence Regional Medical Center, Kansas City Power and Light, Kansas City Southern Railroad, Marion Merrell Dow, Marley Cooling Tower, Maxon Computers, National Seminars, Oread Laboratories, Payless Cashways, Pryor Resources, Puritan-Bennett, Research Health Services, Santi Agri Vet, Scientific Education Partners, Shook Hardy Bacon, Sprint, St. Luke's Hospital, Twentieth Century Investors, United Telecomunications, Woodley Building Maintenance OTHER: H & R Block Foundation, Silicon Prairie Technology Association, University of Kansas Medical Center, Victor Speas Foundation
Technology in Context-Teacher Research Internships	St. Louis/ Eastern Missouri Region	1993 9 3 1992 11 2 1991 12 3 1990 14 2 1989 10 2 1988 5 1	American Association of Immunologists, McDonnell Douglas Corp., McDonnell-Douglas Foundation, St. Louis Civic Progress, U.S. Food and Drug Administration
Nevada			
Teacher Research Associates (TRAC)	Las Vegas (Teachers recruited nationally.)	1993 10 (All positions at DOE Field Office in Nevada)	Department of Energy
New Jersey			
NJBISEC* Teacher Improvement Project (TIP) *New Jersey Business/Industry Science Education Consortium	New Jersey (16 of 21 counties)	1993 16 N.A. 1992 37 24 1991 35 24 1990 34 22 1989 13 7 1988 13 4 1987 11 3 1986 7 2 1985 9 1 1984 6 1 1983 2 1	COMPANIES: Applied-Signal, Biometallics, BOC Technical Center, Ciba-Geigy, Energia, Ethicon, Merck & Company, Microscopy Research Laboratories, Mobil Chemical Company, Mobil Oil Refinery, Mobil Research & Development, New Life Health Products, Optical Data, Princeton Scientific Enterprises, Public Service Electric and Gas, Sandoz Pharmaceutical, Schering-Plough, Siemens Corporate Research, Unilever Research U.S., Visidyne UNIVERSITY RESEARCH LABS: Princeton University (Photonic and Optoelectronic Materials Center, Plasma Physics Lab, Polymer Labs); Rutgers, The State University (Center for Advanced Biotechnology & Medicine, Center for Advanced Food Technology, Center for Agricultural Molecular Biology, Center for Ceramics Research, Center for Computer Aids for Industrial Productivity,

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $3360/8 weeks Sponsor fee: None	No participating university. Teachers develop an Action Plan.	Program serves K-12 teachers.	John Wilson Johnson Controls World Services TRC Building 1200 Stennis Space Center, MS 39529 601/688-2880 FAX 601/688-7528
Stipend: $4800/8 weeks Sponsor fee: $500	No college credit. Teachers keep a journal with lesson plans.	Will develop a year-long leadership program during the school year.	Linda Segebrecht Science Pioneers, Inc. 425 Volker Boulevard Kansas City, MO 64110 816/531-5124 scipi@delphi.com
Stipend: $500/week; 6-9 weeks; $200 for materials/supplies; $500-1800 for travel to make presentations at conferences; $1500 for curriculum development and follow-up activities Total sponsor cost: $2200-3500	St. Louis University Medical School, University of Missouri-St. Louis, Washington University Medical School Teachers develop, write, field test, and revise lessons related to internship. 1 graduate credit available.	Serves K-12 teachers; school districts provide release time for interns to help other teachers.	Paul S. Markovits Mathematics and Science Education Center University of Missouri 8001 Natural Bridge Road St. Louis, MO 63121 314/553-5650 FAX 314/553-5342
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs).	Sally A. Gonzalez DOE Field Office, Nevada Office of External Affairs P.O. Box 98518 Las Vegas, NV 89193-8518 702/295-4628 FAX 702/295-0154
Stipend: $5000/8 weeks ($4000 in summer; $1000 during academic year) Sponsor fee: $1000 for program administration; $600 for academic year follow-up. Some sponsors pay less with difference met by NSF funds.	Princeton University; Advanced Technology Centers at Rutgers, The State University; Glassboro State College (as of 9/92, "Rowan College"); New Jersey Institute of Technology; The William Paterson College of New Jersey Telecommunications network; workshops during academic year; individual and small group academic year follow-up with college faculty members; curriculum development module; teacher	Includes middle school teachers; provides financial support for teacher inservice, disseminates TIP teacher modules statewide. Future directions include targeting minority and underrepresented teachers and comprehensive evaluation of teachers and host research mentors.	Gertrude M. Clarke NJ BISEC Physics/Engineering Physics Department Stevens Institute of Technology Castle Point on the Hudson Hoboken, NJ 07030 201/216-5635 FAX 201/216-5638

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
New Jersey (cont'd) NJBISEC TIP (cont'd)			Center for Plastics Recycling Research, Fiber Optic Materials Research Program); New Jersey Institute of Technology (Center for Manufacturing Systems, Hazardous Substance Management Research Center, Technology Extension Centers for Information Services) OTHER: Educational Testing Service, Morrristown Memorial Hospital, Rahway Hospital
Teacher Research Associates (TRAC)	NJ, Eastern PA (Teachers recruited nationally.)	1993 11 1992 13 (All positions are at Princeton Plasma Physics Laboratory.)	Department of Energy
New Mexico Teacher Research Associates (TRAC)*	Northern New Mexico (Teachers recruited nationally.)	1994 18 1993 17 1992 25 1991 20 1990 17 1989 15 (All positions are at Los Alamos National Laboratory.)	Department of Energy
Teacher Research Associates (TRAC)	Albuquerque (Teachers recruited nationally.)	1993 3 1992 4 (All positions are at Sandia National Laboratories.)	Department of Energy, Sandia National Laboratories
Teacher Research Associates (TRAC)	Albuquerque (Teachers recruited nationally.)	1993 8 1992 8 (All positions are at Inhalation Toxicology Research Institute.)	Department of Energy
New York NSF Science & Technology Center for Photoinduced Charge Transfer Summer Research Program for High School and Community College Teachers	National (40% from Rochester, NY area)	1994 12 1993 11 1992 10 1991 6 Total participants: 27	National Science Foundation

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
	resource agent outreach. College credit available by individual negotiation.		
Stipend: $4400/8 weeks	Princeton University Follow-up meetings and seminars for regional participants.	This is part of the national TRAC program (see under multisite programs).	Pamela R. Lucas Science Education Program Princeton Plasma Physics Lab P.O. Box 451 Princeton, NJ 08534 609/243-3049 FAX 609/243-2299 dcarroll@pppl.gov
Stipend: $4400/8 weeks; $200 for acquiring college credit. Travel expenses are reimbursed. Housing allowance: $1000 for non-New Mexico teachers	University of New Mexico grants college credit through their Graduate Center and Continuing Education Division. Teachers' research is supplemented by weekly group meetings, tours, and lectures durring the appointment. Teachers design and implement a transfer/curriculum component which represents the teachers' reseach.	This is part of the national TRAC program (see under multisite programs)	Carol Mooney Los Alamos National Laboratory P.O. Box 1663 MS P278 Los Alamos, NM 87545 505/667-1919 FAX 505/665-4093 cmooney@lanl.gov
Stipend: $4400/8 weeks Housing allowance: $1000	Associated Western Universities	This is part of the national TRAC program (see under multisite programs in this matrix).	Mercedes Belarde Department 3020 P.O. Box 5800; MS 1351 Sandia National Labs Albuquerque, NM 87185-1351 505/889-2319 FAX 505/889-2323
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs).	David Bice Inhalation Toxicology Research Institute Box 5890 Albuquerque, NM 87185 505/845-1019 505/844-5403
Stipend: $750/week for 8 weeks	University of Rochester No college credit. Teachers take a short course on Photoinduced Charge Transfer.	Hands-on scientific research. Collaborative with industry and university.	Debbie Shannon Department of Chemistry University of Rochester Rochester, NY 14627 716/275-8286 FAX 716/242-9485 stc@chem.chem.rochester.edu

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
New York (cont'd)			
Science Outreach Program	New York City and Tri-state area	1993 5 1992 11 (All positions are at Rockefeller University)	COMPANIES: MGM FOUNDATIONS: Annenberg, Astor, Bristol-Myers Squibb, Carnegie, Dreyfus, ESSEL, McDell, NY Times Foundation GOVERNMENT: National Institutes of Health (MHSRAP) OTHER: American Society of Biochemistry & Molecular Biology
Summer Research Program for Secondary School Science Teachers	New York City	1993 21 1992 19 1991 19 1990 11 (All positions are at Columbia University.) Total participants: 41*	Bristol-Myers Squibb, Burroughs-Wellcome Fund, Charles Edison Fund, CIBA-GEIGY, Connaught Laboratories, Greenwall Foundation, Hoffman LaRoche, Howard Hughes Medical Institute, National Science Foundation, New York Times Co. Foundation, Wyeth Ayerst
Teacher Research Associates (TRAC)	Upton, Long Island (Teachers recruited nationally.)	1993 26 1992 25 (All positions are at Brookhaven National Laboratory.)	Department of Energy
VISION II (Vision of Industry and Schools Initiating an Ongoing Network)	Mid-Hudson Valley, NY	1993 18 12 Total teachers served previously: 56	COMPANIES: Alliance Pharmaceutical, Arden Hill Hospital, Central Hudson Gas & Electric, Chromalloy Turbine Technologies, HUCK International, IBM, International Paper, Minolta Advance Technology, Nepera, Orange & Rockland Utilities, OSRAM Sylvania, Texaco Research Center OTHER: Local school districts, Orange-Ulster Board of Cooperative Educational Services (BOCES), Semiconductor Research Corporation UNIVERSITIES: SUNY College at New Paltz
North Carolina			
VISION-North Carolina	North Carolina	1993 15 5 1992 15 4 1991 20 5	COMPANIES: DuPont, IBM, MCNC, Northern Telecom FOUNDATIONS: SRC Education Alliance GOVERNMENT: Dwight D. Eisenhower Grants, North Carolina Math/Science Education Network OTHER: Public and private schools

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Information N.A.	Cornell Medical School, Sloan-Kettering, Columbia University College of Physicians & Surgeons and Teachers College, CUNY Lectures, workshops, monthly meetings to discuss action plans of teachers, weekly meetings to discuss science reform, curriculum development & dissemination.	Primarily lab research experience over 2 summers, includes email/ Internet training, library facilities, networking, grant writing for teachers. High school students can also do lab research.	Bonnie Kaiser Box 53 The Rockefeller University 1230 York Avenue New York, NY 10021-6399 212/327-7431 FAX 212/327-7519 bonnie@rockvax.rockefeller.edu
Stipend: $6000/ summer $1000 for professional travel or supplies	Columbia University Weekly summer seminars; Action Plan; workshops during academic year with Columbia Teachers College faculty to support implementation of classroom transfer. Annual Alumni meeting and dinner. No college credit available.	*Teachers work 2 consecutive summers. Teachers' and students' attitudes and student data are being assessed in the program evaluation	Jay Dubner Columbia University College of Physicians and Surgeons P&S 11-511 630 W. 168th Street New York, NY 10032 212/305-6899 FAX 212/305-5775 jd109@columbia.edu
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs).	Karl Swyler Brookhaven National Laboratory Building 438 Upton, NY 11973 516/282-7171 FAX 516/282-5832
Teachers do not receive a stipend.	SUNY College at New Paltz Lesson plans based on industry applications and methodologies are developed by teachers. Graduate credits in secondary field work are available.	This program originated as a summer program funded by SRC Education Alliance and mid-Hudson industry sponsors. It changed to an academic-year format in 1993-94. Program does not offer work experience, but provides awareness and exposure to workplace technologies and changing processes.	Alanna M. Smith Orange-Ulster BOCES RD 2, Gibson Rd. Goshen, NY 10924-9777 914/294-5431 FAX 914/294-2619
Stipend: $2000/4 weeks	North Carolina State University, University of North Carolina-Chapel Hill 2-3 days during academic year of follow-up activities are based on expressed teacher needs. Teachers develop curriculum enhancement activities.	Graduate credit is offered. Program does not offer paid work experience but exposes teachers to industry environment and application of math and science.	Glenda Carter CRMSE Box 7801 North Carolina State University Raleigh, NC 27695-7801 919/515-6920 FAX 919/515-7634 carter@poe.coe.ncsu.edu

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Ohio			
Cleveland's Teacher Internship Program	Greater Cleveland	1993 11 3 450 internships at 60 corporations over past 14 years	COMPANIES: American Gas Assn., AmeriTrust, BP America, Cleveland Advanced Manufacturing Program, Cleveland Recycling, Cleveland Electric Illumination, Cook United, Diamond Shamrock, Donn Corp., Dow Chemical, East Ohio Gas, Eaton Corp., Electric Vehicle Assn., FOSECO, General Electric, General Systems, B. F. Goodrich, Harshaw Filtrol, Institute for Enviromental Education, IBM, Jones & Laughlin, Keithley Instruments, E. M. Klein, Lakewood Economic Center, Lear Siegler, Leaseway Transportation, Lubrizol, Modern Curriculum Press, Mogul Division - Dexter, National City Bank, Ohio Bell Telephone, Parker Hannifin, Picker, Price Waterhouse, Reliance Electric, Republic Steel, ROM-AIRE Solar Corp., St. Vincent Hospital, SCM Glidden, Sherwin Williams, Sohio Petroleum, SPS Technologies, Standard Oil Company, Stouffer Foods, Technicare, TRW, Union Carbide, Western Reserve Assn., Wyatt Company GOVERNMENT: County Office of Economic Development, NASA-Lewis Research Center, Shaker Heights Board of Education UNIVERSITIES: Cleveland State University
Partners for Terrific Science Industrial Internship Program	Southwestern Ohio/Northern Kentucky/ Southern Indiana tri-state	1993 5 4 1992 9 6 1991 2 1	COMPANIES: Emery Group, Henkel Corp., Hilton Davis Co., Marion Merrell Dow, Procter & Gamble, Quantum Chemical Co. GOVERNMENT: National Science Foundation, US Department of Education, US Department of Energy/Fernald Environmental Restoration Management Corp. OTHER: American Chemical Society- Cincinnati Section, Ohio Chemical Council
Project GEMMA (Growth in Education through a Mathematical/Scientific Mentorship Alliance)	Dayton, OH and the Miami Valley	1993 22 9 1992 13 7 1991 19 9 1990 10 4 Total participants: 55	COMPANIES: Bank One-Dayton, Children's Medical Center, Delco Chassis and Harrison Divisions of General Motors, EG&G Mound Applied Technologies, Scitex Digital Printing, The Analytic Sciences Corporation FOUNDATIONS: The Alliance for Education GOVERNMENT: Wright Patterson Air Force Base

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $400/week in year one; thereafter rate increases by $50/ week for each successive year a teacher participates; ceiling of $750/week. Sponsor fees: Sponsor companies pay fee of $200/week per teacher.	Cleveland State University Teachers earn up to 7 graduate credits from the University's School of Education. Teachers participate in weekly field trips and produce a new learning unit for the classroom.	College and university professors also participate. CTIP also has a component just for Cleveland Public Schools math and science teachers.	Joseph H. Chadbourne CTIP 18554 Haskins Road Chagrin Falls, OH 44023-1823 216/543-7303 FAX 216/543-7160
Each employer sets and pays salary. Teachers also receive stipend from Partners program and an outreach allowance.	College of Mt. St. Joseph, Miami University, Raymond Walters College, University of Cincinnati, Xavier University Classroom Applications Workshop during the summer and academic year. 4 graduate credits in Chemistry.	This is one component of the Partners for Terrific Science Initiative, which includes Industrial Application Workshops; HealthTech: Healthy Choices in a Technological World; a Facilitators' Program for teachers; High School Mentoring Program; Summer Camps; and an Affiliates Network.	Lisa Meeder Miami University 420 E. University Blvd. Middletown, OH 45052 513/424-4444 x219 lmmeeder@miavx3.mid.mushio.edu
Stipend: $3200/8 weeks or $4000/10 weeks Seminar Fee: Sponsors pay the Alliance for Education a mimimum of $500/site (or $250/ teacher if more than 2 teachers per site) to help defray seminar costs.	Sinclair Community College, The University of Dayton, Wright State University Pre-mentorship orientation, bi-monthly summer seminars facilitated by university mathematics and science educators and GEMMA teacher leaders. Transfer Plans developed in the summer are field tested in the classroom. Academic-year Symposium and site visits conducted by GEMMA teachers and mentors disseminate transfer strategies to other teachers. Graduate credit is offered by University of Dayton and Wright State University at reduced cost to teachers.	Field-tested projects have been compiled into two volumes entitled *Let's Get Real.* GEMMA teachers help plan and conduct a one-week, multisite experience for K-8 Alliance for Education grantees. "Tool Kit" grants up to $250 are available to support classroom transfer.	Sue Rinehart Alliance for Education 2100 Kettering Tower Dayton, OH 45423 513/222-2934 FAX 513/222-0636 aa0026@dayton.wright.edu

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Ohio (cont'd)			
Teacher Research Associates (TRAC)	Cincinnati (Teachers recruited nationally.)	1993 4 1992 4 (All positions are at Fernald Environmental Management Center.)	Department of Energy
Teacher Research Associates (TRAC)	Miamisburg (Teachers recruited nationally.)	1993 4 (All positions are at EG&G Mound Applied Technologies.)	Department of Energy
Oregon			
IISME/Educator Excellence Program	Portland Metro area	1993 100 29 1992 61 1991 39	COMPANIES: ADC Kentrox, Althin Medical, Blue Cross/Blue Shield, Bonneville Power Administration, Carson Oil, Davis Tool, Epson Portland, First Consumers National Bank, Fujimi, InFocus, Intel, Lazerquick, Leupold & Stevens, METRO, Metro Washington Park Zoo, NIKE, Northwest Regional Education Lab, Oregon Center for Advancd Technology Education, Oregon Video Productions, Peco Manufacturing, R.S. Dow Neurological Sciences, Tektronix, Tuality Healthcare, US Army Corps of Engineers, Wacker Siltronic, Washington County Department of Housing PROFESSIONAL-TECHNICAL CONSORTIA: Business-Education Compact, Clackamas Technical Education Consortium, Mt. Hood Regional Cooperative Consortium, PAVTEC Education Consortium
Community Business Education Center (CBEC) Teacher Internship Program	Jackson County, OR	Program begins 1994	Oregon State Workforce Quality Grant
Industry Inititiatives for Science and Math Education (IISME) Coos Bay	Coos Bay, OR	1993 3 N.A. (First year of program)	Sponsors fund 100% of program.
Linn-Benton Business Education Compact	Linn and Benton Counties, OR	1993 17 11 (First year of program)	COMPANIES: Brudvig, Baker, Johnson & Co.; Celwane R.F.; CH2MHILL; Hewlett-Packard; Linn Gear OTHER: Albany Police Department, Community Services Consortium, Starker Forest, U.S. Bureau of Mines, U.S. Environmental Protection Agency

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs)	Susan Walpole Fernald Environmental Restoration Management Corp. P. O. Box 398704 Cincinnati, OH 45239-8704 513-648-6321 FAX 513/648-6903
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs).	Lucy Anne Cates EG&G Mound Applied Technologies P.O. Box 3000 Miamisburg, OH 45343-3000 513/865-4020 FAX 513/865-3952
Stipend: $3480/8 weeks Sponsor Fee: $780; $2880/$577 for 6 weeks; $1440/$280 for 3 weeks	Oregon Graduate Institute, Portland State University, Teachers develop Action Plans during the summer; Academic seminars 4-6 times/year; computer network. College credit is required.	IISME Oregon is operated under the auspices of the Business-Education Compact. The State of Oregon recently granted funds to the Compact to replicate the IISME program. (See other IISME programs under Oregon.) The Compact coordinated a 4-day Summer Industry and Research Visitation Program for 32 PAVTEC counselors and career coordinators.	Pat Moore Business-Education Compact of Washington County P.O. Box 500, 74-250 Beaverton, OR 97070 503/627-5505 FAX 503/627-5533
Information N.A.	CBEC offers school-business partnerships, classroom speakers, career interest appointments, education field trips, and mock employment interviews for Jackson and Jospehine County schools in Southern Oregon.	This program will start its teacher fellowship component in summer 1994 with seed money from the Business Eduction Compact of Washington County.	Pam Hall CBEC 500 Monroe Medford, OR 97501 503/773-3957 FAX 503/773-3977
Stipend: $480/week for 7 weeks	Resume writing workshops for teachers, orientation meetings.	Program started in 1993 with seed money from the Business Education Compact of Washington County.	Jim Phillips Southwestern Oregon Community College Training and Development Center 340 Central Coos Bay, OR 97420 503/269-0123 FAX 503/269-0323
Information N.A.	Oregon State University Focus group follow-up after completion of internship experience. Teachers develop action plan for converting work-based experience to curriculum changes.	This program is offered by a non-profit coalition of business & education leaders in the community as part of a full menu of work-based learning opportunities programs.	Mike Brawn Linn-Benton Business Education Compact 121 2nd Ave, SW Albany, OR 97321

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Oregon (cont'd)			
Roseburg Area Business/Education Consortium (RABEC)	Douglas County, OR	1994 is first year of fellowship program.	Business/ Education Compact of Beaverton via Murdock Charitable Trust
Pennsylvania			
Dutch Country Academic Alliance for Chemistry	Lancaster and Lebanon Counties	1993 15 3 1992 20 3 1991 20 5 1990 20 4	AAHE, Dreyfus, Woodrow Wilson Foundation
Teacher Research Associates (TRAC)	Pittsburgh (Teachers recruited nationally.)	1993 11 1992 6 1991 4 (All positions are at Pittsburgh Energy Technology Center.)	Department of Energy, Office of Science Education and Technical Information
Rhode Island			
Industrial Fellowships for Teachers (IFT)	State of Rhode Island	1993 12 4 1992 8 2 (1992 was first year.)	Burroughs Welcome Mfg., Hoechst Celanese, Naval Underseas Warfare Center, Raytheon, Rhode Island Math/Science Coalition, Rhode Island Department of Employment and Training
South Carolina			
Teacher Research Associates (TRAC)	Aiken (Teachers recruited nationally.)	1993 6 1992 7 1991 4 (All positions are at Savannah River Ecology Lab.)	Department of Energy, Associated Western Universities
Teacher Research Associates (TRAC)	Aiken (Teachers recruited nationally.)	1993 6 1992 5 (All positions are at Savannah River Laboratory.)	Department of Energy
Tennessee			
Meharry Medical College Research Centers for Excellence (RCE) Outreach Program & Science Motivation Program (SMP)	Middle Tennessee	1993 5 1992 5 (All positions are at Meharry Medical College	GOVERNMENT: National Institutes of Health, National Science Foundation

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Information N.A.	Umpqua Community College Previously, RABEC has partnered with the local Job Service Employers Committee (JSEC) to coordinate Shadow Day activities for high school students. Current activities have expanded to local Workforce Quality Committee to explore school-to-work.	RABEC will start its teaching fellowship component in summer 1994 with seed money from the Business Education Compact of Washington County. RABEC has just begun coordination of a multimillion dollar construction project which will provide business/education partnerships throughout the planning and building of a professional office complex.	Bill Korpa 2400 Stewart Parkway #100 Roseburg, OR 97470 503/673-6891 FAX 503/673-3802 bkorpa@ednet1.osl.or.gov
Information N.A.	Elizabethtown College, Franklin & Marshall College, Lebanon Valley College, Millersville University. Workshops, lectures and demonstrations offered during the summer.	Teachers work with college research faculty.	Elizabeth Neyer Elizabethtown High School Elizabethtown, PA 17022 717/367-1437
Stipend: $4400/8 weeks $1000 housing allowance and travel expenses	Associated Western Universites Teachers are encouraged to conduct academic-year workshops based on their summer experience.	This is part of the national TRAC program (see under multi-site programs).	Fred R. Brown Pittsburgh Energy Technology Center P.O. Box 10940 Pittsburgh, PA 15236-0940 412/892-5942 FAX 412/892-4152
Stipend: $650/week Sponsor fee: None	University of Rhode Island Teachers prepare A/V presentation of their industry experiences and develop instructional units. Teachers earn 3 college credits.	State Department of Employment and Training grant pays 50% of teacher stipend for new sites; Eisenhower grant pays for university coordinator's stipend. Teachers receive $250 mini-grant for classroom transfer materials.	Stephanie Sullivan Executive Director Rhode Island Math Science Coalition P.O. Box 6248 Providence, RI 02940 401/455-4058 FAX 401/331-3842 sks@math.ams.org
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities. College credit is available.	This is part of the nationwide TRAC program (see under multisite programs).	Denise Atkins Savannah River Ecology Lab P.O. Drawer E Aiken, SC 29801 803/725-9726 FAX 803/725-3309
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities.	This is part of the nationwide TRAC program (see under multisite programs).	Russ Ferrara Savannah River Technology Center Building 773-66A Aiken, SC 29808 803/725-8295 FAX 803/725-1528
Information N.A.	Meharry Medical College offers a summer recombinant DNA technology course and Saturday and after-school classes/labs.	Particular emphasis on African-American and other underrepresented groups.	Susan DeRiemer or Fred Hamilton Division of Biomedical Sciences Meharry Medical College 1005 D.B. Todd Blvd. Nashville, TN 37208 615/327-6508 FAX 615/321-4694

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Tennessee (cont'd)			
Teacher Research Associates (TRAC)	Oak Ridge (Teachers recruited nationally.)	1993 41 1992 7 (All positions are at Oak Ridge Associated Universities.)	Department of Energy
Teacher Research Associates (TRAC)	Oak Ridge (Teachers recruited nationally.)	1993 45 1992 40 (All positions are at Oak Ridge National Lab.) Total participants: 300	Associated Western Universities, Department of Energy
Texas			
Science Teacher Access to Resources at Southwestern (STARS) Summer Research for Biological Science Teachers	Colling, Dallas, Denton, Rockwall, Tarrant Counties-North Texas	1993 4 1992 3 (All positions are at University of Texas Southwestern Medical Center at Dallas)	GOVERNMENT: State of Texas OTHER: American Association for Immunologists, American Physiological Society, American Society of Biochemistry and Molecular Biology
Summer Research Apprenticeship for Minority High School Students/Teachers	Dallas-Ft. Worth area	1993 3 1992 3 1991 2 (All positions are at the University of Texas Southwestern Medical Center)	COMPANIES: Southwestern Bell FOUNDATIONS: National Institutes of Health OTHER: Southwestern Graduate School of Biomedical Sciences
Texas Teacher Internship Program (TTIP), Texas Alliance for Science, Technology and Mathematics Education	Texas, primarily Austin, College Station, Corpus Christi, Dallas, Galveston, Houston	1993 21 10 1992 32 24 1991 32 16 1990 9 4 1989 2 1	COMPANIES/CORPORATE FOUNDATIONS: Advanced Micro Devices, Bell Helicopter, Bendix Field Engineering Corp., Exxon Chemical Americas, Hoechst Celanese, IBM, M/A/R/C, Mobil Exploration and Producing, Oryx Energy Co., Shell Development, Tenneco Gas, Textron PRIVATE FOUNDATIONS: Harris and Eliza Kempner Foundation GOVERNMENT/GOVERNMENT AGENCIES: NASA-Johnson Space Center, National Science Foundation UNIVERSITIES: University of Texas Medical Branch
Utah			
Science/Math Partnership	Davis County, UT	1993 35 7 Anticipate 50+ teachers in 1994	Information N.A.

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities. 6 college credits can be earned through the University of Tennessee, Knoxville	This is part of the nationwide TRAC program (see under multi-site programs).	Peggy King Oak Ridge Institute for Science & Education Box 117 Oak Ridge, TN 37831-0117 615/576-5660 FAX 615/576-0202
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $6600/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities. 6 college credits can be earned through the University of Tennessee, Knoxville	This is part of the nationwide TRAC program (see under multi-site programs).	Terry Lashley Oak Ridge National Laboratory P. O. Box 2008, Chinn Building 105 Mitchell Rd., MS 6496 Oak Ridge, TN 37831-6496 615/574-5919 FAX 615/576-9496 tl7@ornl.gov
Stipend: $5000/10 weeks	The University of Texas Southwestern Medical Center at Dallas Teachers work in a research laboratory during the summer for ten weeks and present a research seminar at the end of the summer.	All projects are developed in response to teachers' requests and are provided free of charge.	Henry Zot The STARS Center The University of Texas Southwestern Medical Center 5323 Harry Hines Boulevard Dallas, TX 75235-9039 214/648-9505 FAX 214/648-9508 zot@utsw.swmed.edu
Stipend: $5000/8 weeks	Teachers participate in all laboratory activities such as attending seminars and presenting their results at laboratory research meetings.	Program also includes 12-14 students per year.	Joel M. Goodman Department of Pharmacology The University of Texas Southwestern Medical Center 5323 Harry Hines Blvd. Dallas, TX 75235-9041 214/648-2359 FAX 214/648-2994 goodma02@swmed.edu
Stipend: $15-17/hour Sponsor fee: $1000 (members); $1500 (non-members)	Texas A&M University Teachers develop a Curriculum Implementation Plan (CIP), keep a journal, and participate in workshops during the internship. Alliance staff observe teachers teaching from their CIPs during academic year. 3-6 college credits are available.		Brian Walenta EDCI College of Education Texas A&M University College Station, TX 77843-4232 409/845-8384 FAX 409/845-9663
Teachers receive no stipend, only inservice credit.	University of Utah Inservice workshop to share experience/ knowledge		Glen Taylor Davis County School District 45 E. State Street Farmington, UT 84025 801/451-1108 FAX 801/451-1333

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Virginia			
Approach To Training And Competency (ATTAC) 2000 Teacher Internship Program	N.A.	1993 8 4	AMOCO Oil Co., NASA-Langley, Siemens Automotive, Virginia Space Grant Consortium
Teacher Research Associates (TRAC)	Newport News (Teachers recruited nationally.)	1993 7 1992 6 1991 3 (All positions at Continuous Electron Beam Accelerator Facility)	Department of Energy, Associated Western Universities
Washington			
Boeing Defense and Space Group (BDSG) Summer Program for Teachers	Puget Sound area, WA	1994 9 1993 10 1992 9 1991 8 1990 8 1989 6 (All positions at Boeing)	The Boeing Company
Teacher Research Associates (TRAC)	Washington	1993 42 1992 38 1991 34 (All positions are at Pacific Northwest Laboratories.)	Department of Energy
University of Washington Science/ Mathematics Project	Puget Sound	1993 10 10 1992 9 1991 8 1990 7	COMPANIES: Bassetti, Norton, Melter & Rekevics; Boeing; Bristol-Myers Squibb; Ford Motor Company; Immunex Research & Development; Physio-Control; Pugent Power and Light Company; Rocket Research Company/Olin; SAFECO; Seattle Water; US West; Washington Natural Gas; Weyerhaeuser; ZymoGenetics, Inc. GOVERNMENT: Battelle Pacific Northwest Laboratories, Bonneville Power Administration, Environmental Protection Agency, METRO, Office of the Superintendent of Public Instruction UNIVERSITIES: Fred Hutchinson Cancer Research Center, University of Washington Applied Physics Laboratory
West Virginia			
Teacher Research Associates (TRAC)	Morgantown (Teachers recruited nationally.)	1993 8 1992 5 1991 2 (All positions are at the Morgantown Energy Technology Center.)	Department of Energy

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
	Other information N.A.		Diane Hagemann Virginia Peninsula Chamber of Commerce P.O. Box 7269 Hampton, VA 23666 804/766-2000 FAX 804/865-0339
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities. 3 or 4 graduate credits are available through a local university.	This is part of the nationwide TRAC program (see under multisite programs).	William B. Williams CEBAF Mail Stop 16C 12000 Jefferson Avenue Newport News, VA 23606 804/249-7128 FAX 804/249-5065
Stipend: $3000/6 weeks	University credit available through Seattle University.	This program is developed cooperatively with partnered school districts to meet their needs in changing the way they do business. Program is focused on systemic change at the building and district level.	Gary Lee The Boeing Company P.O. Box 3707 M/S 9F-62 Seattle, WA 98124 206/657-6395 FAX 206/657-8167
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7315/8 weeks	Teachers submit a final report and conduct workshops for their fellow teachers based on the summer research. College credit available.	This is part of the nationwide TRAC program (see under multisite programs).	Royace E. Aiken Pacific Northwest Laboratories P.O. Box 999, MS K1-66 Richland, WA 99352 509/375-6929 FAX 509/375-2576 re aiken@pnl.gov
$3000-4000 (during second summer).* Local companies and agencies provide tuition and university fees; school districts provide $2000 in release time.	University of Washington Teachers develop an Action Plan; quarterly follow-up meetings, teachers attend graduate classes in the evenings.	*Program leads to a Master of Education degree. It spans 3 summers and 2 academic years. Second summer is an industry internship.	Carole Kubota 122 Miller Hall, DQ-12 University of Washington Seattle, WA 98195 206/543-6636 FAX 206/543-8439 kubota@u.washington.edu
Stipend: $4400/8 weeks; housing and travel allowance available. Sponsor cost: $7000/8 weeks	Teachers participate in lectures, seminars, and hands-on research that can be applied to classroom activities. College credit is available through West Virginia University.	This is part of the nationwide TRAC program (see under multisite programs).	Larry Headley Morgantown Energy Technology Center P.O. Box 880 Morgantown, WV 26507-0880 304/291-4314 FAX 304/291-4403

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Wisconsin			
Mathematics and Science Teachers' Business and Industry Awareness Project	Southeast Wisconsin	1993 11 9 1992 5 4 1991 20 12 1990 21 11	Information N.A.
Multisite Programs			
American Association of Immunologists High School Teacher Internships in Immunology (AAI-HSTII)	Nationwide (Sites vary annually). Host sites in 1993 in FL, LA, MO, NY, OH, TX.	1993 11 6 1992 5 5 Total participants: 51	AAI, various pharmaceutical companies
American Physiological Society High School Science Teacher Research in Physiology Program	Nationwide	1993 12 12	GOVERNMENT: National Institute of Diabetes, Digestive and Kidney Diseases OTHER: American Physiological Society
American Society for Biochemistry and Molecular Biology (ASBMB) High School Science Teacher Research Fellowship Program	Nationwide	1993 49 49 1992 32 N.A. 1991 40 N.A. 1990 40 N.A. 1989 30 N.A. Total participants: 225	ASBMB, Department of Education, National Science Foundation, Non-profit Foundations
American Society for Cell Biology/Society for Developmental Biology Summer Research Teacher Fellowship Program	Nationwide (Host sites in 1993 in AR, CA, DC, FL, GA, IL, NC, NY, PA, RI, TN, TX, VA)	61 teachers to date	American Society for Cell Biology, National Science Foundation, Society for Developmental Biology

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $3000/teacher	Marquette University, University of Wisconsin-Milwaukee Course in curriculum issues provided by Marquette University. 3 college credits available at no cost to teachers.	Serves K-12 teachers. Teachers required to write and field test a curriculum unit related to thier internship.	Adele Hanson Metropolitan Milwaukee Mathematics Collaborative 8529 W. Chapman Greenfield, WI 53228 414/427-0343
Stipend: $3000/5 weeks No additional cost to sponsor	Varies annually. In 1992: Harrington Cancer Center, University of Florida, Tulane University, University of Rochester, St. Louis University, Washington University Teachers develop classroom exercises for national distribution, field test activities, and present them at local and national teachers' meetings. College credit will be available in the future.		Carl W. Pierce Harrington Cancer Center 1500 Wallace Blvd. Amarillo, TX 79106 806/359-4673 FAX 806/354-5887
Stipend: $500/week for 8-10 weeks and $750 allowance for attendance at annual meeting	Complimentary attendance at APS Spring meeting with associated in-service workshop.	Program serves K-12 teachers.	Marsha Lakes Matyas APS 9650 Rockville Pike Bethesda, MD 20814-3991 301/530-7132 FAX 310/571-1814 marsha@aps.mhs.compuserve.com
Stipend: $5000/10-12 weeks; optional $500 for supplies; $500 for mentor's lab Sponsor cost: $6000	Ongoing relationships between mentors and teachers are strongly encouraged via classroom visits, lab visits, equipment/textbook donations, etc. No universities are affiliated with this program, although many placements are in ASBMB members' university laboratories. No college credit available.	Program was founded in 1984 and professionally evaluated in 1991.	Peter Farnham ASBMB 9650 Rockville Pike Bethesda, MD 20814 301/530-7147 FAX 301/571-1824 pfarnham@asbmb.faseb.org
Stipend: $4850/10 weeks Sponsor cost: $5000+	Many universities and research facilities participate by hosting a teacher/mentor team. Emphasis is on follow-up activities and a school system commitment that will allow the teachers to capitalize on the summer program and improve their science lab instruction. No college credit available.	Teachers develop a research plan with scientist mentors who are members of ASCB or Society for Developmental Biology and then spend 10 weeks working in that scientist's lab.	Dorothy Doyle American Society for Cell Biology 9650 Rockville Pike Bethesda, MD 20814 301/530-7153 FAX 301/530-7139

PROGRAM NAME	AREA SERVED	# of TEACHERS & HOST SITES	FUNDING SOURCES
Multisite Programs (cont'd)			
American Society for Clinical Investigation High School Science Teacher Summer Research Fellowships	Nationwide	1994 9 N.A. 1993 10 N.A. 1992 10 N.A. 1991 10 N.A.	ASCI, Bristol-Myers Squibb, Glaxo Inc., Harcourt Brace/Holt Rinehart & Winston, Merck Institute for Science Education, Monsanto, Ortho Pharmaceutical, Sterling Winthrop, Upjohn
Partners in Science	14 states: AZ, CA, CO, ID, KS, MT, NE, NJ, NM, NV, OR, PA, TX, WA	1993 112 59 1992 89 45 1991 71 34 1990 59 N.A. 1989 52 N.A. 1988 32 N.A. Total participants: 240	COMPANIES/CORPORATE FOUNDATIONS: Allied Signal Foundation, ARCO Chemical Company, ARCO Foundation, Bristol-Myers Squibb, GTE Foundation, Research Corp. PRIVATE FOUNDATIONS: Gates Foundation, Robert Z. Hawkins Foundation, M.J. Murdock Trust, Whitaker Foundation, William Randolph Hearst Foundation
Teacher Research Associates (TRAC) Program*	Nationwide	1993 336 28 1992 322 26 1991 200 21 1990 174 14 1989 146 14 (All host sites are DOE laboratories.)	Department of Energy
Teacher Research Fellowship Program, U.S. Department of Agriculture	Eight Western states	1993 8 N.A. 1992 6 N.A. 1991 7 N.A.	USDA - Agricultural Research Service
International Programs			
Danish Gymnasium Industry Project Information N.A.			Information N.A.
Teacher Release to Industry Program (TRIP)			Information N.A.

STIPEND & FEE	EDUCATIONAL COMPONENT/ AFFILIATED UNIVERSITIES	NOTEWORTHY ASPECTS	CONTACT
Stipend: $6000/8-10 weeks Sponsor fee: $2000	No university is affiliated with this program. No college credit available. Teachers bring what they have learned in the lab back to the classroom. ASCI members maintain contact with the teachers, and where possible, host lab visits for students.	The ASCI hopes to expand this program to include sponsorship of students to work alongside the teacher in the host lab.	Christin Mailn-Dorsen ASCI 6900 Grove Road Thorofare, NJ 08086 609/848-1000 X209 FAX 609/848-5274
Total over two years: $14,000 (Stipend: $5000; travel funds up to $500; academic year enrichment funds $500; discretionary funds up to $1000). Teachers can apply for up to $5000 to facilitate classroom transfer at the end of the internship.	45 universities place teachers. Annual conference brings together participants from all sites.	For high school teachers, typically chemistry and physics. Works with existing programs where possible (such as Colorado Alliance for Science, Industry Fellows Program in San Diego, IISME San Francisco, and Partners in Science & Industry-Los Angeles elsewhere in this Directory.)	Brian Andreen Partners in Science Research Corporation 101 N. Wilmot Rd. Suite 250 Tucson, AZ 85711-3332 602/571-1111 FAX 602/571-1119
Stipend: $4400/8 weeks; housing allowance up to $1000; travel allowance. Sponsor cost: $7000	15 universities offer credit. Electronic networking available; 20% of internship is spent attending lectures, seminars, groups meetings and developing instructional materials.	*See individual entries in this Directory for each DOE-TRAC site. Teacher numbers for 1993 duplicate those listed under each individual program.	John Ortman U.S. Department of Energy Teacher Research Associates Office of Science Education & Technical Information ET-32 Washington, D.C. 20585 202/586-1634 FAX 202/586-0019 john.ortman@mailgov.er.doe.gov
Information N.A.	Some worksites are on university campuses.		Elizabeth Ferguson Agricultural Research Service 800 Buchanan St. Albany, CA 94710 510/559-6080 FAX 510/559-5634
			Finn Lindhard Director of Education & Cultural Affairs Amstgarden 2 Kongens Vaenge 3400 Hillerod, Denmark +45-42-26-66-00 FAX +45-48-24-29-14
			Karen Pomeranz Faculty of Teacher Education Deakin University Burwood Campus 221 Burwood Highway Burwood, 3125 Australia +03-244-6417 FAX +03-244-6974

F603-94ER76002

Sharing Our Successes II:

Changing the Face of Science and Mathematics Education through Teacher-Focused Partnerships

October 13 - 14, 1994

Lawrence Hall of Science, University of California
Berkeley, California

Organized and Hosted by

IISME

Industry Initiatives for Science and Math Education

Conference Funders

AT&T

Intel Foundation

LHS Lawrence Hall of Science

NASA

National Science Foundation

Research Corporation

Triangle Coalition for Science and Technology Education

Over 85 scientific work experience programs for teachers have been identified in the United States and abroad. Participation by representatives from most of these programs is anticipated.

Conference fee $100

Travel stipends available

A national conference of scientific work experience programs (SWEPs) for K-12 teachers

Who should attend?

Program Directors and Managers
Teacher Leaders
Key Participants from Industry, University Labs, and Government Labs

Registration deadline August 29, 1994

Provisional Conference Agenda

Sharing Our Successes II
October 13 - 14, 1994
Lawrence Hall of Science, U. C. Berkeley

Wednesday, October 12
Travel Day

5:00 - 6:00 p.m.	Teacher Orientation/Welcome (@ hotel)
6:00 p.m.	Reception for Participants or No-Host Dinner

Thursday, October 13

8:30 - 8:45 a.m.	**Welcome** Dr. Marian Diamond, Director, Lawrence Hall of Science
8:45 - 10:15 a.m.	**Sharing Successes: Telling our Stories, Broadening our Contexts** **Teachers Modeling Success** Judy Young, IISME Peer Coach Sandy Van Natta, Peer Mentor, Partners for Terrific Science **Building Teacher Communities** Dr. Milbrey McLaughlin and Dr. Joan Talbert, Stanford University **Linking SWEPs to Reform Efforts** Tamra Busch-Johnsen, Business-Education Compact of Washington County Dr. Roland Otto, Lawrence Berkeley Lab Dr. Bonnie Kaiser, Rockefeller University
10:15 - 10:30 a.m.	Break
10:30 - Noon	**Roundtable Session I**
Noon - 1:00 p.m.	Lunch (*seating by program type for informal discussion*)
1:00 - 4:00 p.m.	**Program Coordinator Session I - DOE Program Evaluation Workshop** Dr. Susan Loucks-Horsley, The National Center for Improving Science Education Irene Hays, Pacific Northwest Laboratories **Teacher Session I - Reflections on Teacher Leadership & the Role of Strong Professional Communities** TBA
4:00 - 4:15 p.m.	Break
4:15 - 5:45 p.m.	**Roundtable Session II**
6:00 - 8:00 p.m.	Sunset Reception on the Plaza and Entertainment

Friday, October 14

8:00 - 8:15 a.m.	**Welcome** Dr. Glenn T. Seaborg, Chairman, Lawrence Hall of Science and Nobel Laureate
8:15 - 8:30 a.m.	**SWEP Power for the Year 2000** Deborah Grossman, DuPont Photomasks, IISME Board of Directors
8:30 - 10:15 a.m.	**Teacher Session II** **Teachers as Change Agents** **Telecommunications in the Classroom** **Recommendations** **Program Coordinator Session II** **DOE Report on Student Outcomes** Dr. Jean Young, The National Center for Improving Science Education **Panel on SWEP Evaluation Efforts** Jay Dubner, Columbia University Dr. Kathryn Sloane, University of California, Berkeley Dr. Violet Rohrer, Spring Arbor College **The State of the SWEP Network: Where Do We Go From Here?** Lauren Williams, Triangle Coalition for Science and Technology Education
10:15 - 10:30 a.m.	Break
10:30 a.m. - Noon	**Roundtable Session III**
Noon - 1:00 p.m.	Lunch (*seating by region for informal discussion*)
1:00 - 2:30 p.m.	**Roundtable Session IV**
2:30 - 2:45 p.m.	Break
2:45 - 3:15 p.m.	**Teacher Report and Recommendations** **Closing and Adjourn**
4:30 p.m.	Bus transportation to IISME 10-year Anniversary Gala from various Berkeley locations

All conference participants are invited to join industry leaders, mentors, teachers and high-level administration officials at an elegant reception and dinner celebrating the 10-year Anniversary of the IISME program in the San Francisco Bay Area and the launching of IISME 2000, our second decade initiatives. The evening begins at the Tech Museum of Innovation in San Jose. Details and invitation will be sent under separate cover.

Travel Information

Hotel Accommodations

The following hotels offer special rates for conference participants:

THE BERKELEY CITY CLUB (510/848-7800; FAX 510/848-5900). The Berkeley City Club, a Mediterranean-style residence club designed by architect Julia Morgan, is located near the campus. It is a short drive from the Lawrence Hall of Science. [Special rate of $75-single/$85-double (includes hotel tax, parking, fitness room, inside pool and $5 towards breakfast).]

BANCROFT CLUB HOTEL (510/549-1000; 1-800/549-1002; FAX 510/549-1070). This newly-renovated hotel, originally designed in 1928 by architect Walter T. Steilberg, is located across the street from the campus near shops, cafes, and the University Art Museum. [Special rate of $69-standard/$79-double (includes continental breakfast). Fee parking available.]

FACULTY CLUB residence (510/643-9655; FAX 510/540-6204). The Faculty Club is located on campus. No bellhop service. [Special rate of $54/night with private bath or $42/night for shared bath; $61/49 for corresponding double occupancy (includes continental breakfast). Fee parking available.]

THE HOTEL DURANT (510/845-8981; 1-800/238-7268; FAX 510/486-8336). The Durant Hotel is a 140-room full-service hotel built in 1927. Located near campus, this hotel is adjacent to shops, restaurants, and public transportation. [Special rate of $66-75/night (includes continental breakfast). Fee parking available.]

WOMEN'S FACULTY CLUB residence (510/642-4175; FAX 510/204-9661) The Women's Faculty Club is located on the UC Berkeley campus. No bellhop service. Men and women welcome as guests. [Special rate of $69/night (includes breakfast bar and private bath). Fee parking available.]

General Hotel Information

* Reservations must be made prior to September 1, 1994.

* Mention the "IISME Conference" to receive the special UC Berkeley rate.

* Bus service will be provided from a location central to these hotels to and from the Lawrence Hall of Science for the conference.

* UC Berkeley's Campus Shuttle Service runs twice an hour ($.50 one way) to and from Hearst Mining Circle on campus to the Lawrence Hall of Science.

Airport Shuttle Transportion

The following door-to-door airport shuttle transportation from the Oakland and San Francisco International airports is available:

Call Bay Porter Express at 415/467-1800 (or from the airport dial 1-800/287-6783): $16/person each way from either airport to Berkeley.

Call Bay Area Shuttle at 415/873-7771: $15/person each way from Oakland; $16/person each way from San Francisco. (To go directly to the Durant Hotel, the price is $10/person from the San Francisco Airport; $12/person from the Oakland Airport.)

Note: The Oakland Airport is the most convenient one to Berkeley. (BART mass transit is also available from the Oakland Airport to the downtown Berkeley station. Taxis are available at the Berkeley BART station.)

Airline Discounts

To facilitate your travel arrangements, discounted airfare has been negotiated with United Airlines, American airlines, and USAIR. These fares are based on published round trip within United States mainland and Hawaii to Oakland, San Francisco, and San Jose airports.

* A 5% discount off any published fare in effect when tickets are purchased subject to all applicable restrictions.

* A 10% discount off applicable unrestricted coach fare in effect when tickets are purchased (YUA, Y26 or Y28 fares).

* Offer valid for travel between October 10-18. 1994.

To take advantage of this discount, follow these steps:

1. Call Seyla, Stan, Jim or Arlene at M and R Travel Assoc. Inc. at 1-800/696-2637 or in California at 510/549-1500.

2. Identify yourself as an attendee of the "IISME Conference."

Travel Stipend Guidelines

Thanks to generous grants from the U.S. Department of Energy, Intel Foundation, and NASA, funding is available for selected participants attending the conference. While we can't guarantee stipends, we hope to be able to accommodate most people's needs.

1) Grants of up to $500 per SWEP program manager and $850 per SWEP teacher are available.

2) Grants may be used to cover any of the following expenses:

   A) Airfare between home and San Francisco Bay Area
   B) Car mileage (at $ .29 per mile) between home and Berkeley
   C) Ground transportation between airport and hotel
   D) Hotel for the nights of October 12, 13, 14, and 15
   E) Any meals not provided by conference from October 12 dinner through October 15 breakfast
   F) $100 conference fee

3) Recipients of travel stipends must submit receipts for all expenses to be reimbursed.

4) Priority for travel grants will be given to:
   A) Presenters and facilitators on conference agenda
   B) Teachers (target is one teacher from each SWEP)
   C) Participants willing to act as recorders at Roundtable sessions and at plenary sessions
   D) Early registrants

5) Procedure for applying for a travel grant:
   A) Complete and return Travel Stipend Application with your conference registration.
   B) Recipients will be notified by September 7.
   C) Applicants who do not receive a travel stipend can request a full refund of the $100 conference fee if IISME is notified of cancellation by September 15.

Registration Form

Sharing Our Successes II: Changing the Face of Science and Mathematics Education through Teacher-Focused Partnerships

October 13 - 14, 1994

Lawrence Hall of Science, University of California, Berkeley, California

Please include a separate Registration Form for each individual attending the conference. **Type or print in black ink.** Photocopy additional forms as necessary. **Disseminate to key teachers and mentors.**

Full Name_____ Title_____

Name and location of scientific work experience program (SWEP) with which you are affiliated

_____

Organization/School_____

Mailing Address_____

City_____ State_____ Zip_____

Work Phone _____/_____ Home Phone_____/_____

Fax_____/_____ E-mail_____

Are you planning to bring program materials for the sharing tables? Yes_____ No_____

Travel Stipend Application (optional)

I am a: Teacher Program Manager Other:_____ *(circle one)*

How and when have you have participated with this SWEP (i.e., in what role)?

_____

_____

Method of travel to attend conference_____ Estimated airfare (if appropriate) $_____

Anything else we should know? _____

_____

To secure your place, send the following items by **August 29, 1994** to: IISME, c/o Deskin Research Group, 2270 Agnew Road, Santa Clara, CA 95054:

* Registration Form
* Application for Travel Stipend (Optional)
* Check for $100 payable to IISME (reimbursable for recipients of travel stipends; refundable if IISME is notified of cancellation by September 16, 1994)
* Roundtable Menu Selection

Fax 408/496-5333. Questions? Call Kaye Storm at 415/326-4800 or Susan Aberg at 510/643-6594.

Roundtable Session Menu

We plan to offer four Roundtable sessions during the conference. Some sessions may be repeated with enough demand. Your selection on this form will help us determine the final offerings. Indicate your top choices by writing "1" in four of the boxes provided; indicate second choices by writing "2" in two additional boxes. If you are willing to act as facilitator or recorder for a session (even where a facilitator or recorder is indicated), write "F" or "R" next to any of the boxes you select.

Dissemination Derring-Do ☐
Facilitator: Tina Demirdjian, Partners in Science and Industry Fellowship Program, Los Angeles Educational Partnership Recorder: TBA
Teachers and program coordinators discuss successful methods for and challenges in disseminating classroom transfer plans and ideas to a wider teacher audience.

Expanding our Audiences ☐
Facilitator: Pat Moore, IISME/Educator Excellence Program, Beaverton, OR Recorder: Judith Royer, Lesley College Center for Math, Science and Technology in Education, Cambridge, MA
Share ideas for expanding teacher audiences to include K-8 teachers, pre-service teachers, students, teachers of non-technical subjects, administrators, counselors, teachers of color, and college faculty.

More Than Just a Summer Job: Education Support Services ☐
Facilitator: Jay Dubner, Columbia University Summer Research Program for Secondary Science Teachers Recorder: TBA
Share ideas for summer and academic-year teacher support to ensure that SWEPs do more than give teachers "just a summer job."

Nuts & Bolts: Finance and Management Issues ☐
Facilitator: Stephanie Sullivan, Rhode Island Math Science Coalition Recorder: TBA
Program coordinators share methods for hiring teachers as temporary employees/interns/or co-ops, successfully developing and engaging a Board of Directors, achieving fiscal stability, etc.

Skill Building for SWEPs: Fundraising and Corporate Sponsor Development ☐
Facilitator: Dick French, Partners for Terrific Science, Middletown, OH Recorder: TBA
Program coordinators share fundraising strategies; grantwriting tips; creative funding sources, and methods for truly engaging corporate sponsors, mentors and program champions.

Telecommunications for SWEPs ☐
Facilitator: Bob Shayler, IISME San Francisco Recorder: TBA
Program coordinators discuss results of recent SWEP Telecommunications Survey, their implications, and develop recommendations.

PR for SWEPs ☐
Facilitator: Don Beck, Florida SIFT Recorder: TBA
Program coordinators share written materials, posters, excerpts of videotapes and other materials developed to publicize their programs and recruit teachers and sponsors.

Exchanging Ideas with an International SWEP "Sister" ☐
Facilitator: Karen Pomeranz, Teacher Release to Industry Program (TRIP), Deakin University, Burwood, Australia Recorder: TBA
Explore how federal policies and national attitudes affect what SWEPs can accomplish.

(continued on reverse)

Roundtable Session Menu (continued)

TRAC Teacher Session
Facilitator: Michael Thibodeau, Lawrence Berkeley Laboratory TRAC Program Recorder: TBA ☐
A session specifically designed for teachers in the DOE Teacher Research Associates Program.

TRAC Program Coordinator Session ☐
Facilitator: Eileen Engel, Lawrence Berkeley Laboratory Recorder: TBA
A session specifically designed for DOE Teacher Research Associates Program Coordinators.

Linking into State Systemic Initiatives
Facilitator: Bonnie Kaiser, Rockefeller University Science Outreach Program, New York, NY ☐
Recorder: TBA
Discuss strategies for linking up SWEPs to State Systemic Initiatives.

Creative Financing to Achieve Education Reform
Facilitator: Joanna Fox, Georgia Industrial Fellowships for Teachers Recorder: TBA ☐
Share strategies for tapping into Eisenhower funds, Goals 2000 funding, School-to-Work Transition and Tech Prep programs, etc.

Alliances and Compacts
Facilitator: Tamra Busch-Johnsen, Washington County Business-Education Compact, Beaverton, OR ☐
Recorder: TBA
Explore the role of umbrella organizations in helping to initiate, sustain and expand SWEPs.

Please photocopy and disseminate to key teachers and others from your program who may be interested.

IISME
c/o Deskin Research Group
2270 Agnew Road
Santa Clara, CA 95054

First Class