

PRE-COLLEGE PROGRAMS FOR ENGINEERING CAREER AWARENESS

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This will describe as many career awareness and intervention programs in which the author has taken part in the last five years as time and space permit. Some are national programs, some are international programs, some are local programs designed by the author, some have been carried out several times and others were one-time events. The students reached have ranged from school beginners through college age. They represent activities which engineering colleges might profitably sponsor. Many have been accomplished through the Space Coast Section of the Society of Women Engineers.

EXPANDING YOUR HORIZONS is a national program sponsored by the Math/Science Network (2727 College Ave., Berkeley, CA 94705). Last year over 20,000 girls took part at 67 sites in this career conference for girls grades 7-12, parents, counselors and teachers. Its purpose is to give girls a look at science and math career options. The one-day conference opens with a keynote speaker followed by role model sessions. After a group lunch, girls take part in a choice of two of the hands-on lab sessions provided by the host university while adults participate in a panel discussion on "How can I help?" by industry human resources personnel, enlightened guidance counselors and women in engineering.

In the 1990 version the keynoter was an anthropologist, the first woman president of the Florida Academy of Sciences; in 1991 the keynoter was a Native American princess who is also a major in the US Air Force and Chief of Intelligence for Air Force Technical Applications Lab. This year approximately 20% of those girls and women attending were US minorities. For the \$50 site registration fee EYH sends both student and adult information for hand-out packets. Society of Women Engineers information was added.

FAMILY SCIENCE is also a national program from Northwest Equals (Portland State University, PO Box 1491, Protland, OR 97207-1491) funded by Chevron USA. During four 1 1/2 hour sessions, families do fun simple science activities together, relate science to future studies and careers, and involve parents in their children's education while learning how-to skills and strengthening ties between home and school. Our Family Science has been

targeted to include many minority families because these are less likely to be doing activities that relate science to daily life. Public schools with high minority enrollments were sites for two programs while the third was at a site developed for at-risk students by the National Technical Association, an organization for Black engineers and scientists.

Family Science has been a joint venture between the Space Coast Science Center and Space Coast Section SWE. Science Center education personnel were trained by Family Science but the Center had no funds to carry it out. Space Coast Section obtained a grant from Hewlett Packard for the operation. Each evening's session opens with try-me science teasers followed simple hands-on science and math activities. Women engineers, women engineering students and minority engineers and scientists serve as role models and career awareness audio-visuals are used.

A DAY IN THE ENGINEERING PARK was developed by Florida Section SWE as a teacher in-service for middle/junior high school (grades 5-9) guidance counselors, teachers (especially of math and science) and district administrators. The object is to make these people aware of how women, minorities and handicapped are preparing for and doing science/engineering work. In Florida every student must make a plan in the 8th grade for the final four years of high school so the program aims to reach students through their counselors. Each half-day session features women engineers telling about their educational preparation, work and job satisfactions then serving as guides for plant tours to see women, minorities and handicapped doing their jobs; visits to engineering college labs with professors discussing their disciplines and showing lab activities with women engineering students as guides; a description by the engineering college dean of how to prepare for and succeed in engineering college; and finally, women role models explain their preparation and jobs and then offer to come to schools. Attending teachers are then given the opportunity to write career guidance modules for their classroom from the day's activities in competition for cash prizes and publishing of their modules. This was awarded the SWE national Corning career guidance prize for three years as the most innovative career guidance project in the US.

NAVIGATIONAL AIDS TO THE FUTURE was a joint project of Space Coast Section with the Girl Scouts of America and the Space Coast Science Center through a \$3000 grant from the US Association of Science and Technology Centers. Recently the Girl Scouts revised their program to include a number of badges in modern science and technology. Most leaders were unprepared to assist girls so the program first trained these leaders who then brought their troops to overnight lock-ins at the Science Center. Leaders received science

career awareness training, interacted with women engineer role models and planned their troops' lock-ins. The night's activities were designed to help leaders and Scouts earn specific badges. Members of Space Coast Section provided sufficient activities each in each session for most girls to earn two science/technology badges. At the same time, leaders were learning how to do this themselves. In just the first year, over 200 girls earned an estimated 600 badges. They were rewarded with free passes to the Science Center for their families paid for by the grant. Navigational Aids to the Future has been successfully repeated in two subsequent years.

FRONTIERS IN PHYSICS DAYS were sponsored by the American Physical Society's Education Office (335 E. 45th St., NY, NY 10017) under the College-High School Interaction Committee with the American Association of Physics Teachers. This program has two major goals: up-date the knowledge of physics teachers in current physics through personal interaction with physicists and form cooperative networks of college and high school physics teachers. Each Day is held in conjunction with the national meeting of a special interest group of APS. The teachers' program begins with a discussion of a current physics topic by a physicist followed by demonstrations for the physics classroom by specially trained Physics Teaching Resource Agents of the AAPT. During lunch the teachers sit at tables with physicists and college physics instructors. In the afternoon, teachers are divided into groups corresponding to their geographical locations and they form networks, electing temporary officers and planning at least their first network meeting. College physics teachers join in as full partners and also as resources.

BRIDGES TO PROFITABLE INTERACTION developed from the Frontiers programs. Two different versions have been done so far. In the first version, which was part of a Frontiers in Physics Day, representatives of organizations with programs for women and minorities in science described the resources they could offer physics teachers to attract these groups and then distributed information.

In the second version last summer at the national convention of the Society of Women ENGINEERS, "Bridges" invited organizations with programs to attract women to engineering to describe their resources available to SWE. Group discussion then centered on ways SWE members could use these resources in their career guidance programs.

SCIENCE BY MAIL (Museum of Science, Boston, MA 02114) has scientists serve as pen pals to students grades 5-9, families or other small groups with children of those ages.

Three times a year, packets are mailed to students with instructions on how to use the contents for simple experiments and open "what if?" questions. Students mail their responses to their scientist pen pals who comment on the solutions. This has been so successful that Boston Museum now helps many other science centers in the US participate.

STUDENTS EXPLORE AND EXPERIENCE PHYSICS is a half-day workshop targeting students in grades 5 and 6 in inner city schools with large minority populations. The American Institute of Physics (335 E 45 St., NY, NY 10017) arranges demonstrations by physicists followed by opportunities for the students to do simple related experiments. Sessions are planned for Tampa and Orlando, FL, in conjunction with physics meetings and the national SWE convention.

A NASA GRANT TO SOCIETY OF WOMEN ENGINEERS (345 E 47 St., NY, NY 10017) encourages girls, especially minority, to become aware of engineering careers and to pursue activities that will prepare them for engineering studies. There are several specific actions. Eighth grade girls enter the Higher Education Outreach Program through a college residential summer program followed by year-long mentoring and science activities that is repeated every year until high school graduation. The Big Sister program has women engineers mentor girls grades 8 through high school to improve their science and math studies. For minority girls, grades 8 through 11, who simply enter a project in any science fair, the Space Camp program permits them to apply for a week at Space Camp. About 10-20 girls are selected in each junior and senior division to take part in simulated space training and missions at the camp.

MENTORING through public schools and community/junior colleges also provides opportunities for one-on-one counseling, tutoring and friendships. Many of the students here are minority, at risk and in need of someone who can provide information and inspiration for viable careers. Contact your local schools to find how to participate.

THE ENGINEERING APTITUDE SEARCH is an evaluation provided through JETS (1420 King St., Alexandria, VA, 22314) for students to assess the probability of their success in engineering college studies. Those who sponsor a testing session receive materials and list of students who have registered and then administer the 2 1/2 hour test.

TEAMS is another activity sponsored by JETS. Here teams of students work together to solve engineering problems during a timed session. In addition to local contests, there are also state and national ones.

1992 INTERNATIONAL SPACE YEAR is being coordinated in the US by US ISY Association, 600 Maryland Ave. SW, Washington, SC 20024 and publishes a free newsletter describing activities being done as well as offering many interesting opportunities to participate in projects. @ number of these are being incorporated into other programs.

AWIS MAGAZINE (Association of Women in Science, 1522 K St NW, Washington, DC 20005) publishes a column on Pre-College Career Guidance written by this author in each issue. Comments and and information about interesting and new CG materials and opportunities are included.

This is a sampling of guidance activities which have been successful in some way. The author will be pleased to hear about your activities or to answer questions at the above address or phone 407-723-6835.

