

WEAVING A NETWORK OF EARLY SUPPORT FOR GIRLS IN SCIENCE:  
EMPOWERING GIRL SCOUT LEADERS

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Introduction

Research indicates that extracurricular science activities are an important factor in generating and maintaining girls' interests in science studies and science careers.<sup>1</sup> Unfortunately, girls are less likely than are boys to have these types of experiences.<sup>2,3</sup> Efforts to increase girls' extracurricular science experiences have generally taken the form of summer camps, career fairs, field trips, and science fairs<sup>4,5</sup> but few efforts have focused on finding ways to incorporate more hands-on science activities into those activities and programs in which girls traditionally participate.

Programs developed by the Girl Scouts of the USA and by the Girls Clubs of America (now "Girls, Inc.") are among the few which have taken this approach. Over the past six years, the Girls Clubs "Operation SMART" program has focused on incorporating an ongoing program of science, mathematics, engineering, and computer activities into their regular after school programming for girls.<sup>6</sup> Unfortunately, Operation SMART programs serve only those girls who live close to a Girls Club facility.

Similarly, the Girl Scouts of the USA have incorporated a wide variety of science and mathematics materials and activities into their regular curriculum of "badges" and troop activities and into special materials focused specifically on mathematics and science.<sup>7</sup> Girls Scout science activities include not only nature and environmental science activities but physical science, engineering, and computer science activities, as well.

At the level of the Girl Scout troop (that is, a trained adult volunteer leader and a small group of girls), there is considerable

flexibility in the types of activities the leader and girls choose to do and, unfortunately, the science- and math-related activities are frequently left undone. According to reports from both the national office<sup>7</sup> and from local Girl Scout councils, science-related activities are less often attempted compared to those in more traditionally feminine areas such as arts and crafts. Staff from a number of local Girl Scout councils have consistently reported that one of the greatest barriers to getting girls to do these activities is the adult leaders' lack of comfort and confidence in doing hands-on science activities.

### Development of a Model Training Program

Currently, the AAAS is conducting an exploratory program of Girl Scout adult leader training focusing on the types of hands-on science and mathematics activities which could be done with girls during regular Girl Scout troop meetings and/or during special events such as summer camp or career days. We are working with the 14 local Girl Scout councils that serve Minnesota, North Dakota, and South Dakota. Collectively, these councils serve over 71,000 girls and 18,000 adult leaders. This program is supported by the Bush Foundation of St. Paul, MN.

The purpose of the program is to help adult leaders:

- feel more comfortable and confident about their abilities to lead girls in science and math activities;
- learn to use over 40 science and mathematics activities (on topics such as electricity, air pressure, and water) provided in the workshop materials;
- understand the scientific concepts included in the activities;
- learn how these activities coordinate with the national GSUSA curriculum; and
- learn how to locate additional activities and develop productive relationships with local female scientists and engineers.

Each training workshop includes the following components:

- background information (videotape) on why science and mathematics are important for girls;
- career panel of local women scientists and engineers; and
- hands-on science and mathematics activities, including a leader manual with directions for 40 activities.

In order to assist apprehensive leaders, the science and mathematics activities in this program utilize only common household materials (e.g., paper, "D" batteries, aluminum foil, and paper clips).

### Program Effectiveness

Initial results suggest that with even a short (8 hour) in-service training session, adult Girl Scout leaders can gain both the skills and the confidence to lead informal hands-on science and mathematics activities with girls or other adult leaders. In pilot tests of these programs (supported by the Carnegie Corporation of New York), 6-month longitudinal evaluations indicated that, not only did adult leaders continue to feel more comfortable and confident about doing science and mathematics activities with girls, but they had already done many of the program activities with their Girl Scouts. The girls' reactions were so positive that leaders have returned to their councils asking for more activities next year.

### Computer Component

In addition to the basic program, Apple Computer, Inc. has provided AAAS with a set of four Apple computers and monitors, printer, modem and software which is currently on loan for 3 month periods to the MN/ND/SD Girl Scout Councils. Additional software was purchased with funds from the Bush Foundation. The councils are using these "trial" periods to try out different ways to facilitate computer use by the most Girl Scouts. Councils are using these computers for:

- after school troop meetings where Daisy (age 5), Brownie (6-8) and Junior (9-11) Girls Scouts learn computer skills and earn computer badges;
- summer camp activities where girls can spend extended amounts of time becoming proficient in using various software packages; and
- science and mathematics events such as "Brownie Play Day" and Science at the Shopping Mall".

Through these two projects it has become apparent that local Girl Scout Councils are ready and eager to "step into the future". They not only want girls and their adult leaders to have opportunities to do simple science and mathematics activities, but to then have the opportunity to work with more advanced equipment and technology.

#### Future Plans

Work with the 14 Midwestern councils will continue through early 1991. Dissemination of this model program has already begun: Fund-raising efforts to initiate the program in Iowa, Ohio, and Maine have been started by science educators who have been trained during the MN/ND/SD workshops. Both materials and training are available through the AAAS. In addition, plans for a more advanced workshop have begun in response to adult leader demand. For more information on the basic or advanced programs, contact the author.

#### Summary

The AAAS, with support from the Bush Foundation, Apple Computer, Inc., and the Carnegie Corporation of New York, has made significant progress in developing an effective model to increase young Girl Scouts' exploration of science and mathematics. Furthermore, via the Linkages for the Future project and the Apple Computer project, the Girl Scout councils in the MN/ND/SD area are becoming a national leader in Girl Scouting in science, mathematics, and engineering. At the end of the project, each council will have:

- trained and experienced staff, adult trainers, and adult leaders;

- practical and maintainable equipment, which will allow even girls in remote areas to have access to hands-on science and mathematics experiences; and
- access to an extensive network of local scientists and engineers who can assist in individual, troop, and council-wide science-related activities.

In sum, each council will have the capacity, experience and equipment to maintain an ongoing program of basic science and mathematics experiences for girls ages 5-15.

The impact of this program through Girl Scouts is tremendous. Currently, the Girls Scouts of the USA has nearly 350 local councils serving over 3 million girls, mostly between the ages of 5 and 11. These are the critical years for encouraging girls' interests in science, mathematics, engineering, and computers. In addition, this inexpensive model program can be implemented through church youth programs, summer camps, and a wide variety of other youth-serving organizations; therefore, it has the potential to make a significant impact on the informal science and mathematics education of both young women and young men across the country.

### References

1. Matyas, M. L. & Kahle, J. B. (1986, October 9). Equitable precollege science and mathematics education: A discrepancy model. Invited presentation. Workshop on the Underrepresentation and Career Differentials of Women in Science and Engineering. national Academy of Sciences, Washington, DC.
2. Kahle, J. B., & Lakes, M. K. (1983). The myth of equality in science classrooms. *Journal of Research in Science Teaching*, 20, 131-140.
3. Mullis, I.V.S. & Jenkins, L.B. (1988, September). The science report card: Elements of risk and recovery (Trends and achievement based on the 1986 National Assessment) (Report No. 172011). Princeton, NJ: Educational Testing Service.
4. Matyas, M. L. (198, May). Intervention programs in mathematics and science for precollege females: Program types and characteristics. Invited paper prepared for the Bush Foundation, St. Paul, MN.
5. Malcom, S. M. (1983). Equity and excellence: Compatible goals. Washington, DC: American Association for the Advancement of Science.
6. Girls Clubs of America (1986, August). Operation SMART: A program to encourage every girl in science, mathematics, and relevant technology. new York: Girls Clubs of America.
7. Hussey, S.W. (1987). Contemporary Issues: Leading girls to Mathematics, Science, and Technology. New York: Girl Scouts of the United States of America.