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Great Science for Girls

Great Science for Girls, a five-year initiative of the Educational Equity Center at AED, with funding from the National Science Foundation.

Great Science for Girls: Extension Services for Gender Equity in Science through After-School Programs (GSG) works with intermediaries to build the capacity of after-school centers to deliver evidence-based programs that will broaden and sustain girls' interest and persistent in STEM. Intermediaries are organizations that provide training and technical assistance to networks of afterschool centers in their regions.

In This Issue

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WELCOME!

Welcome to the first issue of the GSG E-newsletter. This quarterly publication will bring news about what's happening at the GSG sites, information about new resources, briefs about research, and an ongoing feature entitled, Did you Know?

NEWS FROM THE FIELD

In September 2007, a Professional Development Institute was attended by the first cohort of GSG intermediaries who since have been implementing Great Science for Girls at sites in their regions. Here are their reports.

Alternatives: High School Students Tutor Middle-School Girls

In Hampton, Virginia, Alternatives is working with the Hampton Parks and Recreation Department and 21st Century Community Learning Centers to implement Girls at the Center. Since January 2008, high school tutors have implemented GSG activities in three community centers, and lessons were aligned with science related Standards of Learning. Plans are underway to expand GSG next year by employing a team of four high school students to deliver science-related activities in afterschool sites in Hampton and Newport News. Student instructors will receive training in curriculum, youth development

practices, and facilitation of experiential activities. Using this peer educator model, approximately 300 students will enjoy Great Science for Girls!

MCCOY: Indy Partners Find Wonderwise Wonderful

In Indianapolis, Indiana, it was a tough sell that morning - 15 degrees after a heavy snowfall - but the dozen or so Great Science for Girls partners who gathered to learn more about gender equity and the 4-H Wonderwise curriculum left energized about their plans for the program. MCCOY learned that Boys & Girls Clubs had worked with Girls Incorporated to develop gender equity training in youth-serving programs throughout Central Indiana. Who better then to help facilitate the half-day training? Focusing on inquiry-based programming and gender-equitable science, implementation sites assessed their staffing, capacity, and finally, upcoming GSG program plans. Owing to the generous support of the Hoover Family Foundation and Junior League, MCCOY has purchased two copies of each Wonderwise module and facilitation guide for our partner sites. Plans also exist for passthrough funding and future trainings next fall.

The Consultation Center: GSG Goes State-wide in Connecticut

The Consultation Center is employing a number of strategies to spread Great Science for Girls throughout the state of Connecticut. In the fall, the Program Coordinator of Strive attended After-School Science PLUS (AS+) training in New York City. In January, a full-day AS+ training session was held, and staff from programs across the state sent representatives. These included: New Britain YWCA and YMCA; the Education Connection, a regional education service center running 12 after school sites; North Branford Family Resource Center (K-3 program); East Windsor Family Resource Center; and the Windsor Youth Services Bureau. Each team received a bin full of start up materials and a copy of the AS+ Planning and Activity Guide. Both the Connecticut Pre-Engineering Program (CPEP), Saturday Academy Program in New Haven for urban girls and Solar Youth, Inc. in New Haven are incorporating GSG into their programming. In March, a workshop on GSG was conducted for the newly formed after school network in the Northwest corner of the state. Now 16 staff from various sites are actively using both AS+ and the Wonderwise 4-H curricula.

TASC: Sixteen GSG Sites and Growing!

In New York City, The After School Corporation (TASC) has sixteen GSG sites and is reaching more than 400 students. The sites participated in three days of After-School Science PLUS hands-on, minds-on science and gender equity training, and a reunion is planned for June 7, 2008. Site coordinators report that the students are "interested and enthusiastic" about their science experiences and that students who are not assigned to science clubs are asking to be included. Two sites have doubled the number of students participating in Great Science for Girls. This spring, students from TASC's City Scholars leadership program received GSG training and used their new skills at afterschool sites implementing GSG. The benefits of including City Scholars in the GSG project are three-fold: extra facilitators allow for smaller groups, facilitators help to prepare for the activity, and role models are built in since City Scholars teens come from the same community as younger students. TASC plans to expand science training this fall to include another 25 sites -- fifteen using After-School Science PLUS and ten using the Wonderwise curriculum from 4-H.

GSG in Washington, DC

The DC Children and Youth Investment Corporation has been using Girls at the Center as well as Wonderwise 4-H, supplemented by "Women's Adventures in Science" biographies. The program is being implemented at six after-school sites: City Gate, Inc., E.L.Haynes Middle School, Perry School Community Center, Alcanzando Metas Foundation, the Science on the Go! program of the Smithsonian Anacostia Museum Academy, and Kidpower.

INTRODUCING THE SECOND COHORT OF INTERMEDIARIES

During 2008-2009, the following intermediaries will join the GSG national initiative. Professional Development Institutes will take place at each location.

The After-School Institute (TASI), Baltimore, Maryland

Community Network for Youth Development, San Francisco, California

Chicago Area Project, Chicago, Illinois

Prime Time, Palm Beach, Florida

EVIDENCE-BASED CURRICULUM

Six evidence-based programs have been selected to be part of Great Science for Girls. These programs have been professionally evaluated and have shown positive outcomes in relation to girls and STEM. New programs that meet the criteria will be added throughout the project.

After-School Science PLUS (AS+), developed by Educational Equity Concepts, includes eleven core activities that focus on inquiry-based physical science and literacy-through-science, with connections to diverse role models and careers. It uses simple materials that are low-cost or free, readily available, and culturally relevant.

Girls at the Center (GAC), developed by The Franklin Institute Science Museum in collaboration with Girl Scouts of the USA, features workshops that foster active science investigation with girls and adults working together, at-home science activities and special family events. The program is built around six basic standards-based science themes: communication, energy, habitats, structures, the science of sports, and water.

Girls Inc., Operation SMART (Science, Math and Relevant Technology), is a set of inquiry-based science activities and staff training guides to help afterschool programs empower girls to pursue science, math and technology careers. All activities incorporate the four elements of the SMART philosophy: equity, experimentation, empowerment, and fun.

SciGirls, developed by Dragonfly TV, Twin Cities Public Television, includes 14 standard-based activities that cover a broad range of STEM content such as life, physical, earth and space science, technology, engineering, and mathematics. Materials include two program DVDs and

Activity Guides that showcase girls doing science investigations, and also include profiles of contemporary women scientists.

Techbridge, developed by the Chabot Space & Science Center, fosters teamwork skills as girls learn to work together to problem-solve. Each unit includes career exploration activities and resources to expand career options. Current units include: Green Design, Toy Design and Engineering, and Electronics and Circuitry.

Wonderwise 4-H, developed by The University of Nebraska State Museum and Nebraska 4-H Youth Development, is a series of learning kits featuring contemporary women scientists as positive role models. Each kit contains a 15-20 minute video profiling the scientist and her work; an interactive CD-ROM; and five hands-on, inquiry-based science activities related to the scientist's field of study.

AFTER-SCHOOL STARTER KIT

The GSG Starter Kit for intermediaries was so successful that we have developed one for afterschool center directors. This Starter Kit provides information on conducting outreach, the GSG project components and expectations, and resources/tools to support the GSG work. It's available upon request in an electronic version by contacting lcolon@aed.org.

DID YOU KNOW?

- Many girls hold negative stereotypes about computing jobs (e.g. they are boring, nerdy, isolating).
- There is often a disconnect between girls' dream jobs, and their plans for getting those jobs. Girls have little information about what the jobs entail, the types of careers available, and the educational requirements to pursue those careers.
- Many girls lack career guidance and support for pursuing STEM careers.

Kekelis, Ancheta and Heber (2005) conducted a qualitative study of the hurdles to getting girls in the technology career pipeline. Although their recommendations are based on findings from a technology program, they are relevant to encouraging participation in all STEM fields. For the article on this study, see *Hurdles in the Pipeline: Girls and Technology Careers* in *Frontiers* Vol. 26 No. 1.

RESEARCH ROUND-UP

Math + Science = Girls

Encouraging Girls in Math and Science: An IES Practice Guide

This report prepared by the National Center for Education Research, Institute for Education Sciences is a practice guide for educators and other school personnel, such as coaches and counselors, to use as one approach to help encourage girls in the fields of math and science. This practice guide includes five specific recommendations that can be carried out to encourage girls

to choose career paths in math and science related fields. For each recommendation there is a section on the quality of evidence that supports it and examples for implementation. The aim of the authors is to provide enough detail so that educators will be able to follow through with the recommendations.

Teach students that academic abilities are expandable and improvable.

- Working hard to learn new knowledge leads to improved performance.
- Remind students that the mind grows and with time and continued effort understanding will get easier.

Provide prescriptive, informational feedback.

- Provide feedback that focuses on strategies, rather than telling students whether they got the correct answer.
- Provide multiple opportunities for students to receive feedback.

Expose girls and young women to female role models who have succeeded in math and science.

- Invite older girls and women who have succeeded in math or science related professions as guest speakers.
- Assign readings about women scientists, mathematicians, etc.

Create a classroom environment that sparks initial curiosity and fosters long term interest in math and science.

- Embed mathematics word problems and science activities.
- Connect mathematics and science activities to careers.

Provide spatial skills training.

- Teach students to mentally image and draw spatial displays in response to mathematics and science problems.

Halpern, D., Aronson, J., Reimer, N., Simpkins, S., Star, J., and Wentzel, K. (2007). *Encouraging Girls in Math and Science* (NCER 2007-2003). Washington,DC: National Center for Educational Research, Institute of Education Sciences, U.S. Department of Education. http://ies.ed.gov/ncee/wwc/pdf/20072003.pdf

NEW RESOURCES

After-School Toolkit: Tips, Techniques and Templates for Improving Program Quality (from the CORAL initiative), a practical, hands-on guide for program managers and practitioners to implement high-quality after-school literacy programming. (Nora Gutierrez, Molly Bradshaw and Kathryn Furano, 2008)

Encouraging Girls in Math and Science: An IES Practice Guide, written by a panel of experts in the field for the U.S. Department of Education's Institute for Education Science. This guide provides evidence-based recommendations to encourage girls in the fields of math and science.

Afterschool Programs: At the STEM of Learning, an issue brief which summarizes the urgent need for STEM learning and the role of after-school in providing relevant opportunities for youth.

A new website from the Center for Advancement of Informal Science Education (CAISE) to support the field of informal science learning by providing resources to build knowledge, share outcomes and improve practice.

Coalition for Science After School. The Coalition is a strategic alliance among individuals and organizations from STEM education, youth development, and out-of-school time programs. The Coalition's mission is to coordinate and mobilize community stakeholders to strengthen and expand opportunities for young people to do and learn science in after-school settings.

New Formulas for America's Workforce 2 & New Tools for America's Workforce. These publications from the National Science Foundation describe roughly 100 projects funded by NSF from 2002 through 2005 that seek to change stereotypes about girls and women in STEM or, at least to understand them further. The products address a range of grade levels, from upper elementary to undergraduate. The publications also provide links to ordering information.

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