NEW TOOLS FOR AMERICA’S WORKFORCE

GIRLS IN SCIENCE AND ENGINEERING
One of the National Science Foundation’s key strategies is to cultivate a world-class, broadly inclusive science and engineering workforce and expand the scientific literacy of all citizens. Why is it important and timely to deepen the American talent pool in engineering and computer science? There are many reasons:

- After 9/11, the United States finds itself no longer able to depend as much on foreign talent for engineers and technology experts. We need more citizens available for classified work, especially to meet new challenges such as those presented by chemical and biological weapons and weapons of mass destruction.
- Companies are exporting jobs to meet their demands for talent in engineering and computer science.
- Having developed their own competitive educational institutions, other countries are growing their potential to produce more engineers and computer scientists than the United States.
- The diversity profile of faculty in the U.S. colleges and universities has not kept up with the profile of graduates in science, technology, engineering, and math (STEM) fields. Graduates are available but are not entering the academic or corporate workforces, are not choosing to stay, or are not advancing to leadership positions.
- Congress recently directed the General Accountability Office to assess the application of Title IX to higher education, and especially to the issues of equitable access, recruitment, and retention of underrepresented students in science and engineering.
- The National Science Board, the National Academies of Science and Engineering, the American Association for the Advancement of Science, and other leading policy entities continue to voice concerns about the lack of diversity in the science and engineering workforce.
- “Why aren’t women in science?” Former Harvard University president Lawrence Summers, launched a public discussion—including hundreds of pages of press coverage—on the topic. Subsequently, Harvard University invested $30 million to change those of its policies and practices that contributed to the slow integration and advancement of women in faculty positions in these fields.
- While women’s participation in medicine, law, and business management has increased to parity or near parity, it remains slow in the high-demand fields of science and engineering, especially with regard to workforce participation and advancement.
- Cross-cultural studies show that occupational participation and segregation by gender is cultural. That is, a society can encourage and support different trends, even in a short period of time, that could lead to a more diverse and dynamic workforce.

In 1981 the Equal Opportunities for Women and Minorities in Science and Technology Act acknowledged that it was U.S. policy and in the national interest to encourage all groups to participate in science and engineering. The act mandated that the NSF report statistics on underrepresented groups and initiate programs fostering their more proportionate representation. Among the suite of programs that followed was the Program for Women and Girls, created in fiscal year 1993 and housed in NSF’s Division of Human Resource Development, Directorate for Education and Human Resources.
The annual budget has varied from $7 million to $10 million. Although relatively small, the NSF program is the largest funding source, public or private, for efforts expressly addressing the need to broaden girls’ and women’s participation in STEM. To date, more than 350 grants have provided the national STEM education enterprise with new ideas, proven good practices, innovative products, research publications, and a leadership of savvy, experienced educators and education researchers. These grants are relatively small but reach nearly every state in the country.

The program aims to change education policy and practice by supporting research, student and educator programs, dissemination of findings, and technical assistance projects. Program findings and outcomes help us understand, for example, how to

- Maintain girls’ interest in science past middle school
- Bring more girls into elective high school math and advanced-placement science courses
- Increase young women’s enrollment in STEM undergraduate studies, particularly in engineering and computer sciences (where there is a national need for more experts and more diverse faculty)

A study of its impact from 1993 through 1996 showed that the NSF program has been successful. Yet while much has been accomplished, national statistics reveal that much more remains to be done. Since 1993—even since 2003—the national need for a larger, more diverse, more science- and computer-literate and skilled workforce has steadily grown, as we progress toward an increasingly technological job market, a more scientifically complex society, and more intense global competition in engineering and technology innovation.
ABOUT THE BOOKS

*New Formulas for America’s Workforce: Girls in Science and Engineering* was published in September 2003. Within seven weeks of issue, the initial print run of 7,000 copies was exhausted and the NSF had to order reprints. Copies on CD and online were also in great demand. NSF's publications Web site showed New Formulas to be the second most requested print publication during October 2003. There were requests for up to 300 copies of the CD at a time, to be handed out at conferences. All copies (paper and CD) are free. The publication reached teachers, formal and informal educational practitioners, researchers, and even parents and students. Ensuing publicity in every major science publication (and the *Washington Post*) revealed the breadth of public interest.

The first *New Formulas* covered about 220 grants from 1993 through 2001. The publication led to:

- New collaborations among education researchers
- New and greater investments in educational programs for female students
- Better understanding of gender differences in career interests and in how students engage in science and mathematics
- Awareness of and better access to widely scattered resources and information
- Deeper comprehension of the educational impacts of NSF’s investments
- Faster and easier press access to findings and leading experts in a field of study that crosses many disciplines

In short, the book informed public discourse about the state of gender diversity in science and engineering, the critical role of education in preparing the workforce, and the constraints on national competitiveness that can result from failing to address diversity issues.

*New Formulas 2* updates the first volume by describing the roughly 100 grants made between 2002 and 2005. There are fewer educational demonstration projects in that edition, but more social-science research studies, dissemination activities, and projects that will provide technical assistance for the implementation of best practices.

*New Tools* is the third volume in this series. This publication is a catalog of the products created by the program grant projects from 1993 through 2005. These products include CDs, DVDs, brochures, program guides, special reports, and informational Web sites. The CD-ROM attached to the back cover contains electronic versions of *New Formulas 2* and *New Tools*. Active links are placed throughout the CD-ROM, allowing the user to easily access the many Web resources featured in the publications. The grants covered in these two publications encompass programs conducted at all educational levels, and include both professional development and formal and informal activities.

We expect the same spectrum of groups to be interested in *New Tools* as in the first *New Formulas*: teachers, faculty, counselors, administrators, after-school program providers, researchers, deans, colleges of education, professional associations, foundations, industry, policymakers, the public media, parents, and students. All are interested in better education, better access to education, better student achievement, and more entrants (and more diverse entrants) into science and engineering careers.
About NSF:
http://www.nsf.gov

About the program:

Any NSF publication may be retrieved at http://www.nsf.gov/publications/. Type in the publication number, e.g., NSF 06-59, or the title.

KEY WORKS IN THE FIELD


ACKNOWLEDGEMENTS-THE PROJECT TEAM

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Acting Division Director, Human Resources Development

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Senior Program Director

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Program Director

At Low + Associates
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Executive Vice President

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Writers

Ross Bankson
Editor

Kate Barry and Danielle Sinkford
Assistant Account Executives

Michael Greenland and Jen Chung
Art Directors

At Large
The 82 Principal Investigators and their teams who carried out these projects and who responded with additional information, reviews, and images
Listen to four radio series exploring different facets of girls’ science education at this WAMC Northeast Public Radio–produced Web site. The Tech-Club interviews successful professionals; and Out-Loud features women’s STEM education from varied perspectives.

Grade level: elementary, middle, high school

See also: Audio Portraits of Women in STEM: HER-STORY CD Set (CD-ROMs)
EXPLORING PHYSICS—ELECTRICITY AND MAGNETISM

http://www.exploringphysics.com/

Meera Chandrasekhar  University of Missouri–Columbia

How does a circuit work? How does a capacitor differ from a battery? This CD-ROM guides girls through experiments designed to answer these and other physics questions through hands-on activities.

94-50533  Grade level: elementary school, middle school, high school

SEEING GENDER: CD-ROM SET

http://www.k-state.edu/seeinggender/index.htm  
http://www.meac.org/Resources/ed_services/SG_WEB/INDEX.HTM

Jacqueline Spears  Kansas State University

Do science and math classrooms inadvertently harbor gender biases? If so, what forms do these biases take, and how can educators address them? Questions like these, and many others, are discussed on this CD-ROM set. Footage includes interviews with middle and high school teachers.

02-25184  Grade level: middle school, high school, undergraduate
### INTRODUCTION TO 3-D SPATIAL VISUALIZATION: AN ACTIVE APPROACH

http://www.delmarlearning.com

<table>
<thead>
<tr>
<th>Sheryl Sorby</th>
<th>Michigan Technological University</th>
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Workbook and **instructional software** combine to sharpen students’ ability to visualize three-dimensional shapes, a skill essential to success in STEM. The friendly, intuitive interface appeals to learners from diverse backgrounds. Includes Teacher’s Resource Guide with sample syllabi and quizzes for smooth integration into any engineering, graphics, or geometry course.

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### AUDIO PORTRAITS OF WOMEN IN STEM: HER-STORY CD SET

http://www.womeninscience.org/

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<tr>
<th>Glenn Busby</th>
<th>Mary Darcy</th>
<th>WAMC Northeast Public Radio</th>
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This two part **radio series** features HER-STORY: THEN, and HER-STORY: NOW. Did you know that the technology that operates your cell phone was designed by a silver screen goddess in the 1940’s? Or, that the first computer programmer was actually the daughter of an 18th century English poet? Actress Kate Mulgrew (internationally known for her role as Captain Kathryn Janeway in Star Trek Voyager) narrates these and other fascinating tales of women’s historical contributions to science and technology. Winner of a 2006 Gracie Award. Want to learn what today’s women pioneers in science and technology are doing to encourage the next generation? HER-STORY: NOW explores award-winning programs that encourage and assist young women in pursuing education and careers in science, technology, and engineering.

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<th>Grade level: all ages</th>
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<td>03-32765</td>
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Powerful Signals is a special radio series composed of two parts. First, 10 feature-length stories explore programs across the U.S., that are working with girls to encourage the next generation of women in science and engineering. Featuring

- Techbridge Oakland: Techbridge offers a “bridge” between middle and high school, including programs designed to encourage girls in science. Now after five years, this program has taught 1,250 mostly minority working class and middle income students.
- The Gidget Pipeline Project K–12: Ohio State University’s After School Technology Club is educating girls to be technology designers, not just users. Gidget is generating a curriculum that will allow other educators to duplicate the after-school technology experience.
- The Lincoln Experiment: Ten years ago, the Lincoln School in Providence, Rhode Island developed a “physics-first curriculum.” Today, 100% of the school’s seniors have at least three years of lab science by graduation.

Second, three audio diaries follow the day-to-day lives of women who have chosen a course of study or career in science and technology. Featuring

- Tracy Drain: The Mars Reconnaissance Orbiter — NASA’s Jet Propulsion Laboratory: A systems engineer, Tracy, describes her journey to launch . . . and the white knuckle wait to see if the project will successfully reach orbit.
- Dr. Lori Polasek: Saving Harbor Seals — Alaska Sea Life Center: Lori talks about her life as a marine biologist on land and sea, and her effort to help save the harbor seals.
- Jennifer Ellsworth: Could Fusion Help Solve the Fuel Crisis? — Massachusetts Institute of Technology: Jennifer and her team at MIT are attempting to create a fusion device that might lead to a new source of energy for the world. Jennifer talks about what life is like for a grad student involved in this work.

To listen to these and other mind-opening audio profiles about women in science, technology, engineering, and mathematics, visit the WAMC radio Web site at womeninscience.org. Users receive the audio CD set free when they send comments to the radio station.

Grade level: all ages
## DRAGONFLYTV®: AUTHENTIC INQUIRY VIDEOS

Nancy Lark  
American Association of University Women Educational Foundation

How can parents get their daughters interested in technology? How should schools and community programs get involved? These questions and many others are explored in the video Tech Savvy Girls. The accompanying resource guide provides discussion topics and helps viewers prepare for the video.

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<th>Grade level: elementary school, middle school</th>
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| Girls can build a Hovercraft or a mini water park ride, test how a hockey stick’s “flex rating” can help score a goal, and find out if dogs are really colorblind. These and many other full-inquiry investigations can be found on DragonflyTV®, broadcast nationally on PBS. The video segments and activity guides can be downloaded from the Web site and are available as podcasts as well. |

| 99-09828—Season 1  
01-25738—Seasons 2 and 3 | 03-37350—Season 4  
05-15566—Season 5 | 04-36260—SciGirls |

| Richard Hudson  
Twin Cities Public Television, St. Paul–Minneapolis |

**DRAGONFLYTV®**

http://www.pbskids.org/dragonflytv

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## TECH SAVVY GIRLS VIDEO AND RESOURCE GUIDE

Richard Hudson  
Twin Cities Public Television, St. Paul–Minneapolis

Girls can build a Hovercraft or a mini water park ride, test how a hockey stick’s “flex rating” can help score a goal, and find out if dogs are really colorblind. These and many other full-inquiry investigations can be found on DragonflyTV®, broadcast nationally on PBS. The video segments and activity guides can be downloaded from the Web site and are available as podcasts as well.

| 99-09828—Season 1  
01-25738—Seasons 2 and 3 | 03-37350—Season 4  
05-15566—Season 5 | 04-36260—SciGirls |
GIRLS CREATING GAMES

http://programservices.etr.org/gcgweb/

Jill Denner | Education, Training, Research Associates

Imagination soars in these computer games designed and programmed by middle school girls using Macromedia Flash MX. Among the highlights: “When Cheese Attacks,” “Who Is Your Dream Date?” and “Cats on the Run.” These choose-your-own-adventure style games feature cool sound tracks and vivid animation.

02-17221 | Grade level: middle school

GIRLS REDESIGNING AND EXCELling IN ADVANCED TECHNOLOGY

http://www.miamisci.org/great/index.html

Judy Brown | Miami Museum of Science, Inc.

If you believe, you can achieve! This video documents the success of science and technology programs for middle school girls at the Miami Museum of Science and Planetarium. Students, parents, and instructors attest to the transformative effect of gender-conscious pedagogy. Includes discussion of how to replicate the program locally.

01-14669 | Grade level: middle school
YOU CAN BE ANYTHING! A MUSIC VIDEO TO ENCOURAGE GIRLS AND WOMEN TO EMBRACE TECHNOLOGY

http://www.umbc.edu/be-anything
Claudia Morrell University of Maryland–Baltimore County

This high-energy music video shows girls that technology is everywhere—and that it isn’t just for boys anymore. Involve girls in information technology by following online instructions for integrating the video into classroom activities. Or link to the Speakers’ Bureau on the Web site, where educators can contact a female Information Technology professional specially trained to present the video.

02-25079 Grade level: middle school

THE CASE OF MISSING HUMAN POTENTIAL

http://www.missingpotential.org
Frank Wilson WVIZ/PBS Ideastream℠, Cleveland

A one-hour videotape, The Case of Missing Human Potential, tracks the root cause of the gender gap in the STEM workforce back to schools, exploring how teaching methods can be either a window of opportunity to young women or a closed door. The problem is presented as a fast-paced mystery, with top-selling mystery writer Les Roberts hosting the investigation, assisted by Dr. Kathryn Sullivan, the first woman to walk in space. The program describes efforts by schools, communities, and businesses to address gender representation in STEM.

02-17109 Grade level: professional development

See also:
Seeing Gender: CD-ROM Set (CD-ROMs)
Through the Glass Wall (Web sites)
Computer Game Design: Involving Girls (Web sites)
Think Again . . . Girls Can! (Web sites)
Tech Team: Project-Based Education for Middle School Girls (Web sites)
Opening the Horizon: Strengthening Science Education for Middle School Girls in Rural Southwest Missouri (Web sites)
### AFTER-SCHOOL SCIENCE PLUS

http://edequity.org/afterschool_materials.php

Barbara Sprung  
Educational Equity Center at the Academy for Educational Development

Two manuals available on this Web site cover everything educators need to know to start community-based after-school science programs: a planning guide offers information on program development and staff training, and an activity guide leads instructors through inquiry-based lessons designed to improve gender representation in the sciences. The site also offers several other related publications for educators and parents. Visit the Web site to learn more.

| 96-32241 | Grade level: elementary school, middle school, professional development |

### FIRST (FEMALE INVOLVEMENT IN REAL SCIENCE TECHNOLOGY)

http://www.chabotspace.org/visit/programs/first.asp

Etta Heber  
Chabot Space and Science Center

Becoming a scientist or an engineer is not just a dream for girls who participate in real science experiences. FIRST provides informal settings for girls to engage in hands-on science at elementary and middle schools in the Oakland Unified School District. Students and their teachers, administrators, and caregivers explore critical environmental issues that affect their lives on a daily basis. Download the form to order a resource guide for parents and teachers to help encourage girls in science.

| 95-55807 | Grade level: elementary school, middle school, professional development |
### National Science Partnership for Girl Scouts and Science Museums

<table>
<thead>
<tr>
<th><a href="http://www.fi.edu/tfi/programs/nsp.html">http://www.fi.edu/tfi/programs/nsp.html</a></th>
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<tbody>
<tr>
<td>Dale McCreedy</td>
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<td>The National Science Partnership’s Hands-On Science Kits contain a <strong>guidebook</strong> and materials for five to seven weeks of science activities for groups of 15 Brownie or Junior Girl Scouts. Two kits have supporting videos starring female scientists. Originally designed to help Girl Scouts meet their badge requirements, these activities can be easily integrated into camp and after-school programs.</td>
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### Sport Science: Using Sports as a Vehicle for Science Learning

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<tr>
<td>Penny Hammrich</td>
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<td>Balance. Force. Speed. Trajectory. Girls in six Philadelphia middle schools investigate these science concepts while engaging in basketball, fencing, soccer, golf, and other sports. As explained in this comprehensive <strong>report</strong>, Sports Science uses sports as a vehicle to teach a standards-based science and math curriculum. Like Temple University’s original Sisters in Science program, Sports Science offers after-school and Saturday programs to accommodate girls’ learning styles.</td>
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### ATHENA PROJECT

http://www.alphacenter.ucr.edu/Brochures/VolumeI_Issue1.pdf

Pamela Clute | University of California–Riverside

On Athena Saturday, middle school girls gather with female college students to share stories about their “sheroes,” or women heroes. Named for the Greek goddess of wisdom and victory, the Athena project links young girls and their teachers with female science and mathematics majors and faculty. Read about the tutoring, teacher-training, and mentoring services to help women excel in science and mathematics in this newsletter.

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### LEARNING ONLINE

http://www2.edc.org/GDI/publications_SR/equity6_04_FULLBOOK.pdf

Katherine Hanson | Education Development Center, Inc.

What constitutes gender balance in e-learning? Through an online professional development course for middle school math and science teachers, “Engaging Middle School Girls in Math and Science,” researchers investigated the effectiveness of training designed to improve gender representation. The final report provides practical guidelines and vital data for improving gender balance in e-learning course-design and implementation.

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UNITED CONNECTICUT FOR WOMEN IN SCIENCE, ENGINEERING, AND MATHEMATICS

http://www.easternct.edu/personal/faculty/cidc/ucwsme.html
http://www.cpep.org/index.html

Carmen Cid, Connecticut Pre-Engineering Program, Inc.

Connecticut colleges, universities, school districts, professional organizations, and businesses all work together to encourage girls and women in science, engineering, and mathematics. The project uses recruitment and retention strategies to improve participation and achievement: a clearinghouse of research on girls and women in these fields; public awareness activities on issues of gender representation; programs to enhance self-esteem and learning for urban middle and high school girls and community college women; and classroom teaching approaches to help K–12 teachers address gender issues. Available resources include downloadable tip sheets for parents and teachers.

94-50026 Grade level: middle school, high school, professional development

BEYOND THE BEAKERS: SMART ADVICE ON ENTERING GRADUATE PROGRAMS IN THE SCIENCES AND ENGINEERING

http://www.bcm.edu/smart/?PMID=2993

Gayle R. Slaughter, Baylor College of Medicine

A comprehensive guidebook for undergraduate women planning to pursue STEM careers. Includes advice on acquiring mentors and gaining the most from research experiences, as well as female-friendly, ethnic-inclusive logic problems for GRE preparation.

99-06394 00-80662 Grade level: undergraduate
<table>
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<tr>
<th>RETENTION OF WOMEN GRADUATE STUDENTS AND EARLY CAREER ACADEMICS IN SCIENCE AND ENGINEERING</th>
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<tr>
<td><a href="http://iupjournals.org">http://iupjournals.org</a></td>
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<tr>
<td>Jill Bystydzienski</td>
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<tr>
<td>Significant barriers still exist for women faculty and underrepresented groups in science and engineering fields. At this national conference, graduate students, faculty, and administrators in women’s studies and STEM fields from more than 55 universities and colleges exchanged information and collaborated to encourage gender-balanced sciences. Read the conference papers on the status of women in STEM fields past and present in the NWSA Journal, Special Issue: ReGendering Science Fields.</td>
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<th>REMOVING BARRIERS: WOMEN IN ACADEMIC SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS</th>
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<tr>
<td>Jill Bystydzienski and Sharon R. Bird (eds.)</td>
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<tr>
<td>This book complements the NWSA Journal, Special Issue: ReGendering Science Fields (vol. 16.1), granting even wider access to ideas shared and generated at the conference on the Retention of Women Graduate Students and Early Career Academics in Science and Engineering. Includes more conference papers on the status of women in STEM fields.</td>
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ACHIEVING GENDER EQUITY IN SCIENCE CLASSROOMS: A GUIDE FOR FACULTY

http://www.brown.edu/Administration/Dean_of_the_College/homepginfo/equity/Equity_handbook.html

Sheila E. Blumstein  Brown University

Supportive classroom environments can help to retain and attract more women science, math, and engineering majors. This handbook is developed as part of Brown’s Women in Science and Engineering (WISE) program. Based on sociological, physiological, and educational research on gender differences in science learning, it presents techniques to foster gender diversity and to make classrooms more welcoming for women students.

94-53676  Grade level: undergraduate, professional development

THE PREPARATION OF GENDER-SENSITIVE SCIENCE TEACHERS IN THE UNIVERSITY OF DELAWARE’S SECONDARY SCIENCE EDUCATION PROGRAM


Kathryn Scantlebury  University of Delaware

Issued by the National Science Teachers Association and recently revised, the resource guide “Standards for Science Teacher Preparation” provides a model for preservice high school teacher education that emphasizes gender-sensitive teaching practices. This document discusses constructivist approaches to classroom instruction, the importance of relating science to everyday life, and the need for teachers to design lessons with student diversity in mind.

94-50022  Grade level: postgraduate
<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Author</th>
<th>Description</th>
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<tr>
<td><strong>NORTHWEST GIRLS COLLABORATIVE PROJECT REPPLICATION GUIDE</strong></td>
<td>Karen Peterson</td>
<td>This model of regional collaboration has brought hundreds of organizations together to exchange ideas, information, and resources on girls' STEM education. The replication guide provides tips on everything an educator needs to set up a network in his or her community: recruitment, the effective use of technology, running conferences, and much more.</td>
</tr>
<tr>
<td><strong>SCIENCE, GENDER, AND AFTERSCHOOL: A RESEARCH-ACTION AGENDA</strong></td>
<td>Merle Froschl</td>
<td>Girls become more engaged in STEM in the informal, collaborative atmosphere of after-school programs. This report from the 2002 Science, Gender, and Afterschool Conference addresses four key issues in the development of such programs: recruitment, content and strategy, professional development, and connecting school and after-school.</td>
</tr>
</tbody>
</table>
### TECH SAVVY: EDUCATING GIRLS IN THE NEW COMPUTER AGE

http://www.aauw.org/research/girls_education/techsavvy.cfm  
Nancy Lark  
American Association of University Women (AAUW) Educational Foundation  
Girls tend to be less engaged by technology than boys. But will getting more girls to sign up for computer science classes solve this problem? If not, how can educators get girls to develop a sustained interest in computers and computer technology? This report, prepared in 2000 by the AAUW Educational Foundation's Commission on Technology, Gender, and Teacher Education, presents timely discussions of these questions and others.  
03-32841 Grade level: professional development

### UNDER THE MICROSCOPE: A DECADE OF GENDER EQUITY PROJECTS IN THE SCIENCES

http://www.aauw.org/research/microscope.cfm  
http://www.aauw.org/k%2012/  
Nancy Lark  
American Association of University Women (AAUW) Educational Foundation  
Over the last decade, the AAUW Educational Foundation and the National Science Foundation have invested close to $100 million in more than 400 projects aimed at getting girls involved in the sciences and math. But what types of projects, specifically, have been funded? And have certain areas been overlooked? These questions and many others are explored in this influential report.  
03-32841 Grade level: professional development
SISTERS IN SCIENCE NEWSLETTER

http://qcpages.qc.cuny.edu/Education/new/sisnewsletter.html

Penny Hammrich
Queens College, CUNY
(formerly of Temple University)

By teachers and for teachers, this quarterly newsletter talks about the practical challenges educators face in bringing gender fairness to the classroom. Read about Sisters in Science efforts to initiate urban girls into STEM, and use sample classroom activities to design gender-inclusive lesson plans.

04-36221 Grade level: professional development

GENDER DIFFERENCES IN THE PERCEPTION AND USE OF AN INFORMAL SCIENCE LEARNING WEB SITE: FINAL REPORT TO THE NSF

http://capsi.caltech.edu/research/documents/GenderDifferencesAschbacher_000.pdf

Pamela Aschbacher
California Institute of Technology

Researchers studied Whyville.net to determine which factors led to the site’s documented success at raising girls’ interest in technology. This 44-page final report lays out findings from their comprehensive survey of site users’ motives and behaviors. An essential resource for developers of girls’ online educational resources.

00-86338 Grade level: professional development

1 This URL is correct despite the misspelling.

See also:
Introduction to 3-D Spatial Visualization: An Active Approach (CD-ROMs)
Tech Savvy Girls Video and Resource Guide (DVDs/Videos and Games)
United Connecticut for Women in Science, Engineering, and Mathematics (Web sites)
After-school and Summer Science Camps for Young Women (Web sites)
Midwest Rural–Urban Girls Collaborative (Web sites)
Tech Team: Project-Based Education for Middle School Girls (Web sites)
Engineering, Science, and Math Increase Job Aspirations (ES MIJA) (Web sites)
Connecting Women across the Computer Science Pipeline: From High School through the Ph.D. (Web sites)
Summer Medical and Research Training Program (Web sites)
CIC WISE Initiative (Web sites)
STEMTeams.org (Web sites)
Science, Gender and Afterschool Community of Practice (Web sites)
Summer Medical and Research Training Program (Web sites)
### EXPLANATOIDSTM

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<tr>
<th><a href="http://www.explanatoids.com">http://www.explanatoids.com</a></th>
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<tr>
<td>Janet Stocks</td>
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Why do we see fireworks before we hear them? Who spins fastest on a merry-go-round? The Explanatoids™ Web site explores the science behind everyday things. Young visitors to the site are encouraged to create their own “junior Explanatoids™” using the site’s step-by-step instructions. Links for educators detail Explanatoids™ techniques and research.

| 02-17033 | Grade level: elementary school |

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### IMAGINATION PLACE!

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<th><a href="http://www.edc.org/CCT/imagination_place/">http://www.edc.org/CCT/imagination_place/</a></th>
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<td>Margaret Honey</td>
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Imagination Place! is an interactive, online club that invites boys and girls aged 8–12 into the world of design, involving them as shapers and makers of technology rather than just users. Employing powerful design, animation, graphics, chat, and sound tools, the Imagination Place! Web site offers engaging problem-solving activities that encourage learners to think deeply about the place of design and engineering in their lives. It’s a place where girls can realize their visions for the future of technology. (Note: Imagination Place! can be accessed only via KAHooTZ, a members-only Internet service for children.)

| 97-14749 | Grade level: elementary school |

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### SCHOOL-BASED S.M.A.R.T.
( SCIENCE, MATH, AND RELEVANT TECHNOLOGY)

<table>
<thead>
<tr>
<th><a href="http://www.girlsinc.org/ic/page.php?id=1.2.1">http://www.girlsinc.org/ic/page.php?id=1.2.1</a></th>
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<tbody>
<tr>
<td>Jessica Drummer Ryan</td>
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S.M.A.R.T. girls rule! School-based programs encourage and educate elementary school girls to understand that mathematics and science are important and relevant. Hands-on activities designed specifically for fourth- and fifth-grade girls encourage them to take risks, experiment, and work in teams to discover how math and science relate to their everyday lives. This Web site offers a list of programs and services available, and activities and information just for girls.

| 94-53748 | Grade level: elementary school |
Life Preservers is an online game designed to teach about evolution and adaptation. This Web site guides teachers on how to use the game, which can fit within a single class period and is grounded in national science standards. The game is part of a research project collecting information about male and female play and learning styles. Life Preservers grew out of research on girls’ and boys’ different approaches to computer games and education, which can be found at http://aliengames.org/.

02-17197
Grade level: elementary school, middle school

AnimalWatch, an online prototype of computer-based mathematics tutoring software, is tailored to middle schoolers’ instructional needs. On this Web site, girls in particular can strive for mastery by emphasizing exploration over competition and effort over innate ability. Hints and positive feedback increase girls’ self-confidence, and math problems addressing girls’ interests spark motivation.

95-55737
Grade level: elementary school, middle school

Led by the pioneering former astronaut, the Sally Ride Science Web site empowers girls to explore the world of science—from astrobiology to zoology and from environmental engineering to rocket science. Parents and teachers will find publications, newsletters, and CDs to encourage girls in STEM. Girls will find links to science activities, camps, and other resources. In the “Engaging Girls” section, you can read profiles of women role models in science, search through pictures of earth taken from the International Space Station, or explore the solar system through high-resolution photographs on NASA’s Planetary Journal. For links to these and other fascinating resources, visit the area of the site titled “Activities & Homework.”

05-33491 04-36230
Grade level: elementary school, middle school
THROUGH THE GLASS WALL

http://mathequity.terc.edu/gw/html/web.html

Andee Rubin | TERC, Inc.

How do children learn math from computer games? What patterns are there in how girls and boys play and learn from computer games? To find the answers, researchers went to store shelves to find games that were strong in math and appealing to both genders. The Glass Wall project investigates the interaction of computer games, mathematics learning, and gender by examining these and other questions. Take a look at the game reviews and descriptions, research summary, and more on this Web site.

95-55641 | Grade level: elementary school, middle school

GIRLS’ SCIENCE PRACTICES IN URBAN, HIGH-POVERTY COMMUNITIES

http://ed-web3.educ.msu.edu/CalabreseBarton/urban.girls.html

Angela Calabrese Barton | Columbia University

Researchers at Teachers College, Columbia University, investigated the ways in which girls who attend urban schools with high poverty rates acquire science literacy, and how they integrate this knowledge into their understandings of themselves and their community. Using data gathered from four middle schools in Harlem and the South Bronx, the project is developing a framework to describe urban girls’ “science practices” (that is, their manner of engaging in science and their motives for doing so) according to three interrelated categories: understanding of science concepts, development of scientific habits of mind, and participation in science activities. With this framework, researchers aim to give a full picture of the way urban girls bring science into their lives—how, for example, do they use the science they’ve learned in school to choose a healthful diet, or conserve natural resources such as water and petroleum? Visit the project’s Web site to view an overview of the methodology and findings from this fascinating study.

04-29109 | Grade level: elementary school, middle school, high school

For your convenience, all New Formulas 2 and New Tools links are active in the electronic version of these publications.
<table>
<thead>
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<th>Web Sites</th>
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<tr>
<td><strong>HEAR OUR VOICES AND THE COMPUTER CLUBHOUSE</strong></td>
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<tr>
<td>Gail Breslow</td>
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<tr>
<td>In 1993 the Computer Clubhouse opened its doors at the Computer Museum in Boston as an after-school resource for young people aged 8 through 18 to explore their own ideas and interests through technology, guided by the support of adult mentors who serve as role models. The Hear Our Voices program for girls was created in 2002, and now over 20 Computer Clubhouses in the United States receive funding and support to hire and train staff dedicated to gender diversity and girls’ programming. Visit the Computer Clubhouse Web site to learn more about Hear Our Voices and the other ways that the Computer Clubhouse is reaching out to girls with technology.</td>
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<td>02-17138</td>
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<td><strong>STEMTEAMS</strong></td>
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<td><a href="http://engineering.tufts.edu/stemteams/about.html">http://engineering.tufts.edu/stemteams/about.html</a></td>
</tr>
<tr>
<td>Katherine Ziemer</td>
</tr>
<tr>
<td>On STEMTeams, university faculty, engineers, teachers, and students work together to get girls from kindergarten through high school interested in science. Four universities have already started STEMTeams. Visitors to the Web site can learn how to launch their own STEMTeams by downloading a PDF version of the manual, located on the site’s “Products” page. Also available: the STEMteams bibliography of research on gender-inclusive teaching.</td>
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<tr>
<td><strong>TELEMENTORING YOUNG WOMEN IN ENGINEERING AND COMPUTING: PROVIDING THE VITAL LINK</strong></td>
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<tr>
<td><a href="http://www.edc.org/CCT/telementoring/index2.html">http://www.edc.org/CCT/telementoring/index2.html</a></td>
</tr>
<tr>
<td>Margaret Honey</td>
</tr>
<tr>
<td>At the Center for Children and Technology Web site, you will learn about projects that engage girls in engineering and design. Find articles, research, and software to support online mentoring, a program where girls create computer graphics, and another where girls engineer solutions to everyday problems.</td>
</tr>
<tr>
<td>94-50042</td>
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THINK AGAIN . . . GIRLS CAN!

http://www.girlscan.org

Janice A. Grackin Stony Brook University, SUNY

From this Web site, download video interviews with eight female scientists who discuss the challenges and rewards of their careers. A biochemist, a geologist, a pediatrician, and others talk about their lives and their passion for science. Essential viewing for girls and young women who want to know what it’s really like to be a scientist. Also available is a free DVD of the interviews.

02-17200 Grade level: elementary school, middle school, high school

MIDWEST RURAL–URBAN GIRLS COLLABORATIVE

http://www.missouristate.edu/mru/home

Paula Kemp Southwest Missouri State University

Advocates of better gender representation from Missouri, Kansas, and northeastern Oklahoma connect at the Midwest Rural–Urban Girls Collaborative Project Web site. Educators can learn about MRU events and conferences and check newsletter updates. Organizations can apply for minigrants or register with the program directory.

05-33581

Grade level: elementary school, middle school, high school, undergraduate, postgraduate

AFTER-SCHOOL AND SUMMER SCIENCE CAMPS FOR YOUNG WOMEN

http://www.spokanecitylab.wsu.edu

Sylvia Oliver Washington State University

“Science at the Summit” after-school camps and programs give girls a chance to explore science, mathematics, and technology related to outdoor themes in the Northwest. Visitors to CityLab’s Web site will find biology, chemistry, and biotechnology lab project resources for teachers and an archive of monthly newsletters for students.

00-86440

Grade level: elementary school, middle school, high school, professional development
AIMING FOR ALGEBRA

http://www.clubgirlstart.org/

Rachel Muir | Girlstart

Browse computer games that inspire kids to excel at math. Read a guide for university faculty on gender diversity in science classrooms. Learn what the Women’s Equity Resource Center has to offer. These and other valuable resources are available on the Girlstart Web site. For a closer look, click first on “Educator Resources” and then on “Educator Links.”

02-17038 | Grade level: middle school

CAN ROBOTICS KEEP GIRLS IN SCIENCE?

http://www.botball.org/

Jerry Weinberg | Southern Illinois University—Edwardsville

Southern Illinois University—Edwardsville studied participants in the KISS Institute for Practical Robotics’ Botball program. A team-based activity that engages thousands of middle and high school students in regional and national robotics competitions and exhibitions, Botball offers a unique educational, hands-on STEM experience that can influence a student’s self-perceptions of their achievement and abilities in STEM areas. Visit Botball’s Web site to learn more about the program, and to find out how your school can get involved.

05-22400 | Grade level: middle school, high school

COMPUTER PROGRAMMING FOR MIDDLE SCHOOL GIRLS

http://www.rapunsel.org/

Kenneth Perlin

New York University, Hunter College, and University of Southern California

To address the serious shortage of women in computer science, researchers at New York University, Hunter College, and the University of Southern California are developing a software environment for “real-time applied programming for underrepresented students’ early literacy” (RAPUNSEL). The project, aimed specifically at teaching computer programming to middle school girls, involves a simulation game in which girls create and manipulate on-screen “character agents.” Visit the RAPUNSEL Web site to read about the project details and to see the prototypes, experiments, and designs of the play systems developed in this project.

03-32898 | Grade level: middle school
### GIRLS DIG IT

**http://www.nyu.edu/classes/mcgee/digit/  
http://www.girlsinc.org/**

Heather Johnston Nicholson  
Girls Inc.

With brushes and spoons to lift and a mesh screen to sift, girls dig up the past. Girls Dig It: An Archaeology Program for Girls Ages 12–14 encourages low-income girls and girls of color to engage in real, reconstructed, and simulated archaeological discovery. Aspiring archeologists can share their results and ask questions of women scientists on this [Web site](http://www.nyu.edu/classes/mcgee/digit/), which offers a remarkable online learning environment.

| 99-08759 | Grade level: middle school |

### GIRLS IN ENGINEERING HANDS-ON MUSEUM EXHIBIT DEVELOPMENT

**http://engineering.tufts.edu/ggs/proginfo.htm**

Ioannis Miaoulis  
Tufts University

Light It Up. Twirl A World. The Wheel of Rhythm. Middle school girls team up with a science teacher, an engineering faculty member and female student, and museum staff to create hands-on exhibits. Called “Girls Get Set for Life,” the program is a model for collaboration among schools, universities, and museums nationwide in enhancing learning experiences of girls and young women. Learn more on the [Web site](http://engineering.tufts.edu/ggs/proginfo.htm) about the science and engineering principles used to develop the exhibits.

| 96-32175 | Grade level: middle school |

### GO-GIRL: GAINING OPTIONS—GIRLS INVESTIGATE REAL LIFE

**http://www.gogirls.wayne.edu  
http://www.smartgirl.org**

Pamela T. Reid  
Roosevelt University, Chicago (formerly of the University of Michigan, Ann Arbor)

Visit the GO-GIRL [Web site](http://www.gogirls.wayne.edu) to learn about the program where middle school girls join university mentors for 10 Saturdays of social science research and career exploration. Then visit SMART-GIRL the Web site that makes the GO-GIRL experience available everywhere: girls can contribute to discussion groups, write about what interests them, and complete an online survey about social issues. At the SmartCenter, live mentors (female University of Michigan undergraduates) guide girls through data analysis to interpret survey results.

| 01-14683 05-07902 | Grade level: middle school |
| MEDIA LITERACY TRAINING FOR MIDDLE SCHOOL STUDENTS |
| Jocelyn Steinke | Western Michigan University |
| Researchers at Western Michigan University examined the efficacy of a media literacy program in teaching children to recognize and resist gender stereotypes. The investigators assessed how the training affects middle school children’s perceptions of women in STEM, their ability to recognize stereotypes in the media, and their attitudes toward STEM and STEM careers. Visit the project's Web site to learn more about the methodology, media literacy training, and findings from the study. The site also features helpful links and access to reports and other publications from the project. |
| 04-29005 | Grade level: middle school |

| TECH TEAM: PROJECT-BASED EDUCATION FOR MIDDLE SCHOOL GIRLS |
| http://www.knowitall.org/techteam |
| Betsy Newman | Educational Television Endowment of South Carolina |
| From this Web site, download manuals on how to start a Tech Team for girls to create their own Web sites, learn about computers and programming, and create and edit “community-based” videos. The site also has manuals and teaching aids on Web design plus links to other Web design resources, more sites aimed at girls and science, and other educational sites just for kids. See samples of games, Flash animations, Web sites, and journals created by Tech Team girls in South Carolina. The site is hosted by South Carolina Educational Television and sponsored by the Girl Scouts and the National Science Foundation. |
| 02-17199 | Grade level: middle school |
THE NATIONAL SCIENCE PARTNERSHIP FOR GIRL SCOUTS AND SCIENCE MUSEUMS

http://sln.fi.edu/TFI/programs/nsp.html#top

Dale McCreedy
Franklin Institute Science Center

Visit this Web site to order the National Science Partnership's Hands-On Science Kits. Each kit contains five to seven weeks of hands-on science activities for groups of 15 girls. Originally designed to help Girl Scouts meet their badge requirements, these activities can be easily integrated into science curricula and after-school programs.

04-36249  Grade level: middle school, high school

SCIENCE ON PATROL

http://www.isof.org/SOP/default.aspx

Bonnie Brownstein
Institute for Schools of the Future, Police Athletic League, New York City, and others

The Institute for Schools of the Future, the Police Athletic League, and other partners, including detectives and police officers, are working together to continue Science on Patrol, a project aimed at motivating underrepresented minorities and middle and high school students, especially girls, to get involved in the sciences. In particular, the project encourages students to link science knowledge and skills with the real-world applications of forensic science. By allowing participants to use science to "solve crimes," this informal project helps them see how abstract concepts, when put to use, can be exciting. Visit the Web site to learn more and to view project materials and presentations.

02-17188  Grade level: middle and high school, informal education

WOMEN WHO WALK THROUGH TIME

http://www.earth.utah.edu/women

Marjorie Chan
University of Utah

Explore earth science with women who are making significant contributions to society. The Women Who Walk Through Time Web site introduces young people to the fascinating field of earth science, including links to other sites on volcanoes, earthquakes, dinosaurs, fossils, and much more. The site is targeted to girls aged 12 through 18, and conveys the idea that women can enjoy and be successful in earth science careers.

96-25566  Grade level: middle school, high school

For your convenience, all New Formulas 2 and New Tools links are active in the electronic version of these publications.
### CHALLENGING GENDER STEREOTYPES WITH COMPUTER-BASED SOCIAL MODELS

Researchers at Florida State University are employing “pedagogical agents” to investigate how different aspects of computer-based social models affect young women’s beliefs and stereotypes about engineering. Pedagogical agents are three-dimensional, animated, computer-based characters that can serve as teachers. [Visit this website](http://ritl.fsu.edu/_Website/projectsPals.asp) to access more information on the project, as well as reports and presentations on the topic.

**Amy Baylor**
Florida State University Center for Research of Innovative Technologies for Learning

**Grade level:** middle school, undergraduate

### GENDER-BASED SCIENCE PERFORMANCE MODELS

The IMMEX website is designed to provide an innovative online environment where teachers can track the development of students’ problem-solving strategies as they work. Teachers can access problem sets, a full-text database of IMMEX research, and training videos for effective classroom implementation.

**Ronald Stevens**
University of California–Los Angeles

**Grade level:** middle school, high school, undergraduate

### THE CASE OF MISSING HUMAN POTENTIAL

A one-hour videotape, “The Case of Missing Human Potential,” tracks the root cause of the gender gap in the STEM workforce back to schools, exploring how teaching methods can be either a window of opportunity to young women or a closed door. The problem is presented as a fast-paced mystery, with top-selling novelist Les Roberts hosting the investigation, assisted by Dr. Kathryn Sullivan, the first woman to walk in space. The program describes efforts by schools, communities, and businesses to address gender representation in STEM. [Visit the website](http://www.missingpotential.org/) to learn more about the project, and to access a storehouse of carefully selected links for adults and kids that provide them with the resources to help them close the gender gap. The site also features information to help find the best science and math camps and organizations, and to learn how to do several at-home activities and experiments.

**Frank Wilson**
WVIZ/PBS Ideastream™, Cleveland

**Grade level:** middle school, high school, undergraduate, professional development
### UNITED CONNECTICUT FOR WOMEN IN SCIENCE, ENGINEERING, AND MATHEMATICS

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<tr>
<td>Carmen Cid</td>
<td>Connecticut Pre-Engineering Program, Inc.</td>
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Connecticut colleges, universities, school districts, professional organizations, and businesses all work together to encourage girls and women in science, engineering, and mathematics. The project uses recruitment and retention strategies to improve participation and achievement; a clearinghouse of research on girls and women in these fields; public awareness activities on issues of gender representation; programs to enhance self-esteem and learning for urban middle and high school girls and community college women; and classroom teaching approaches to help K–12 teachers address gender issues. On these Web sites, parents and teachers can find tip sheets available for downloading.

| 94-50026 | Grade level: middle school, high school, professional development |

### ENGINEERING, SCIENCE, AND MATH INCREASE JOB ASPIRATIONS (ES MIJA)

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<th><a href="http://www.idra.org">http://www.idra.org</a></th>
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<td>Maria “Cuca” Robledo Montecel</td>
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| Intercultural Development Research Association |

Hispanic girls can break down gender stereotypes and see themselves as scientists, mathematicians, and physicians. Through a partnership of universities, school districts, and businesses, Hispanic sixth-grade girls in San Antonio, Texas, participated in creative lessons to increase their interest and skills in mathematics and science. The program included curricular, instructional, training, and support components along with parent engagement. Information gleaned from this project helped form the curriculum *Minority Women in Science: Forging the Way*, a student notebook and teacher guide set with profiles of minority women scientists, science lessons, and life-skills lessons. For more information, please visit the Web site.

<p>| 95-53423 | Grade level: middle school, professional development |</p>
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<tr>
<th><strong>WOMEN IN SCIENCE AND ENGINEERING (WISE)</strong></th>
<th><a href="http://www.wise.sunysb.edu">http://www.wise.sunysb.edu</a></th>
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<tr>
<td>Edith Steinfeld</td>
<td>SUNY at Stony Brook</td>
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<tr>
<td>This <a href="http://www.wise.sunysb.edu">Web site</a> helps to foster a positive climate of WISE students and mentors to sustain interest, curiosity, and achievement to pursue careers in STEM. The program links distinguished scientists, mathematicians, and engineers with clubs through Adopt-a-Club; offers mentoring experiences; provides teacher training and curriculum enhancement; and offers a Parent Advisory Council.</td>
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<td>94-50018</td>
<td>Grade level: middle school, professional development</td>
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<tr>
<th><strong>OPENING THE HORIZON: STRENGTHENING SCIENCE EDUCATION FOR MIDDLE SCHOOL GIRLS IN RURAL SOUTHWEST MISSOURI</strong></th>
<th><a href="http://www.cnas.missouristate.edu/eyh/default.htm">http://www.cnas.missouristate.edu/eyh/default.htm</a></th>
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<tr>
<td>Paula Kemp</td>
<td>Southwest Missouri State University</td>
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<tr>
<td>In rural southwest Missouri, middle school girls participate in an annual conference to increase their interest in science, mathematics, and technology. Opening the Horizon helps students get involved with scientific learning and talk with women scientists and professionals about their careers, work experience, and education. Teachers and parents also learn how to provide enriching science learning experiences for girls. Activity summaries containing processes and procedures needed to design and carry out award-winning computer science, chemistry, biology, and anthropology projects can be found on the <a href="http://www.cnas.missouristate.edu/eyh/default.htm">Web site</a>.</td>
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<td>00-02129</td>
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<th><strong>TECHBRIDGE</strong></th>
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<tr>
<td>Etta Heber</td>
<td>Chabot Space and Science Center</td>
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<tr>
<td>What kinds of technology projects appeal to girls? Working with tools, building robots, and solving problems at school and in neighborhoods are all part of Techbridge, a technology program designed just for middle school girls. Through after-school activities, field trips, family events, and role models, girls are introduced to various applications of technology and encouraged to pursue technical and scientific fields in college and beyond. Publications, sample curriculum, and other resources are available on the <a href="http://www.techbridgegirls.org">Web site</a>.</td>
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<tr>
<td>00-80386</td>
<td>Grade level: middle school, professional development</td>
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### BIOINFORMATICS INITIATIVE FOR HIGH SCHOOL STUDENTS

**http://www.immaculata.edu/bioinformatics/**

<table>
<thead>
<tr>
<th>Susan Cronin</th>
<th>Charlotte Zales</th>
<th>Immaculata University</th>
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Bioinformatics, the integration of biology and information technology, is a fast-emerging scientific field. Hands-on laboratory work, field trips, and use of the NSF-funded, Web-based Biology Student Workbench are all a part of this summer program designed to familiarize female high school students with bioinformatics. Participants strengthen their computer skills, increase problem-solving abilities, and enhance communication skills. Resources and research tools from programs held in 2001, 2003, and 2005 can be found on the [Web site](http://www.immaculata.edu/bioinformatics/).

**00-86360** Grade level: high school

### THE COMPUTATIONAL LABORATORY

**http://tangent.krellinst.org/scied/**

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<tr>
<th>Margaret Honey</th>
<th>Center for Children and Technology, Education Development Center</th>
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The Computational Literacy Project teaches four core science topics (population dynamics, the spread of disease, the carbon cycle, and the rock cycle) through interactive Web-based simulations that include graphing and tabular data features. The [Web site](http://tangent.krellinst.org/scied/) features an “Introduction to Simulations” presentation that helps teachers and students understand the relationship between basic science and the modeling processes fundamental to computational science, the underpinning of much of today’s research.

**04-37787** Grade level: high school

### DISCOVERY UNDER THE HOOD

**http://discoveryunderthehood.com/**

<table>
<thead>
<tr>
<th>Mary Parks</th>
<th>Colgate University</th>
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Communities everywhere have replicated Discovery Under the Hood, the innovative program that introduces high school girls to automobile engineering and repair through a summer of hands-on exploration. This [Web site](http://discoveryunderthehood.com/) is a portal for educators who want to learn more about these programs.

**02-17146** Grade level: high school
According to research, computer programming is not intrinsically interesting to many girls. They are more likely to be attracted to learning that involves a meaningful context, especially as a way to solve a genuine social, personal, or environmental problem. Object-oriented programming languages (such as JAVA) allow one to program by manipulating the relationships between objects in a narrative context rather than executing abstract, linear code. The Center for Children and Technology (CCT) at the Education Development Center (EDC) in New York investigated whether this approach makes programming more accessible to girls. In this experimental research project, ninth-grade girls in an introductory computer programming class at a predominantly Latino urban high school learned how to use flexible, “drag and drop” software to choreograph ice-skating routines. Visit the CCT’s Web site to learn more about the project, and to read the report “Alternative Pathways Into Computer Science: Investigation of Narrative-Bound Interactive Learning Environments for Teaching Girls Programming.”

03-32862 Grade level: high school

A multidisciplinary research team at Utah State University is trying to help girls overcome their negative self-images when it comes to STEM. In particular, the team will test the potential of virtual peers in creating a constructive social environment for girls to learn math. These peers are called pedagogical agents as learning companions, or PALs, and they have been developed in line with findings related to human peer research. Visit the Web site to learn more about the project, and to read some of the publications related to this growing field of online learning technologies.

05-22634 Grade level: high school

Researchers at the University of Texas at Austin are examining how social context influences male and female students’ choices about high school math and science courses and college majors in the Adolescent Health and Academic Achievement (AHAA) study. Visit the Web site to find data, reports, and more information about the project.

05-23046 Grade level: high school
Barbara Whitten Colorado College

Women’s colleges produce female scientists at twice the rate of coeducational institutions. Colorado College researchers are studying the pedagogy, curriculum, and culture of physics departments at six women’s colleges to determine which factors lead to their success in recruiting and retaining female physics majors. The project builds on a previous NSF-sponsored study that compared the practices of undergraduate physics departments with low proportions of female majors against those with higher proportions. The project’s Web site provides detailed recommendations for students, faculty, and administrators based on the study’s findings. The site also features helpful links and publications.

03-32874 01-20450 Grade level: undergraduate

WAYANG OUTPOST: VIRTUAL TUTORING FOR HIGH STAKES MATH ACHIEVEMENT TESTS

http://k12.usc.edu

Carol Beal Information Sciences Institute, University of Southern California

Click on the Wayang Outpost SAT Tutor Web site for tips on using familiar math concepts to solve unfamiliar problems. This prototype of an online tutor allows students to learn test-taking skills from virtual teachers—based on real female scientists—who encourage girls to pursue math-intensive fields of study. Includes links to innovative research in online pedagogy.

04-29125 Grade level: high school

CONNECTING WOMEN ACROSS THE COMPUTER SCIENCE PIPELINE: FROM HIGH SCHOOL THROUGH THE PH.D.


Ellen Walker Rensselaer Polytechnic Institute

How do you encourage women students to pursue careers in computer science? Through PipeLINK, a program to attract high school students to computer science and retain undergraduate and graduate students. Summer research programs, mentoring networks, and teacher training help retain women in the computer science pipeline. Learn more about results and outcomes from the project papers available on the Web site.

94-50007 Grade level: high school, undergraduate, graduate

DIVERSITY IN PHYSICS: LEARNING FROM WOMEN’S COLLEGES WHAT WORKS


Barbara Whitten Colorado College

Women’s colleges produce female scientists at twice the rate of coeducational institutions. Colorado College researchers are studying the pedagogy, curriculum, and culture of physics departments at six women’s colleges to determine which factors lead to their success in recruiting and retaining female physics majors. The project builds on a previous NSF-sponsored study that compared the practices of undergraduate physics departments with low proportions of female majors against those with higher proportions. The project’s Web site provides detailed recommendations for students, faculty, and administrators based on the study’s findings. The site also features helpful links and publications.

03-32874 01-20450 Grade level: undergraduate
Undergraduates can prepare for STEM Ph.D. programs at the Summer Medical and Research Training Program at the Baylor College of Medicine. Visit the program’s [Web site](http://www.bcm.edu/smart/?PMID=0) for application forms and to order a free copy of the guidebook *Beyond the Beakers: SMART Advice on Entering Graduate Programs in the Sciences and Engineering.*

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**SUMMER MEDICAL AND RESEARCH TRAINING PROGRAM**

Gayle R. Slaughter  
Baylor College of Medicine

Undergraduates can prepare for STEM Ph.D. programs at the Summer Medical and Research Training Program at the Baylor College of Medicine. Visit the program’s [Web site](http://www.bcm.edu/smart/?PMID=0) for application forms and to order a free copy of the guidebook *Beyond the Beakers: SMART Advice on Entering Graduate Programs in the Sciences and Engineering.*

<table>
<thead>
<tr>
<th>Grade level: undergraduate</th>
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<td>00-80662</td>
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**PATHWAY TO A STEM BACCALAUREATE DEGREE: RESEARCH TRENDS, EXEMPLARY PRACTICES, AND SUCCESSFUL STRATEGIES**

Frankie Santos Laanan  
Iowa State University

This project seeks to give students enrolled in community colleges the tools to succeed academically in their pre-STEM preparation as well as in the transfer process to four-year colleges or universities. Three products are under development at Iowa State University: an instructional video series about the transition from two- to four-year colleges; the Transfer Student Guide (available in Spanish for the benefit of Spanish-speaking parents), which will contain research, recommendations, students’ reflections, a time line, and a transfer checklist; and a [Web site](http://www.pathway2stemdegree.org) through which these two products and other educational resources will be disseminated to students in two-year colleges, educators in both two-year and four-year institutions, academic counselors and advisors, transfer-center coordinators, personnel in business and industry, researchers, policymakers, and the public.

<table>
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<th>Grade level: undergraduate</th>
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<tr>
<td>05-07882</td>
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</table>
WHY DOES IT WORK? A STUDY OF SUCCESSFUL GENDER EQUITY IN INDUSTRIAL ENGINEERING AT THE UNIVERSITY OF OKLAHOMA

http://www.ou.edu/rise/Publication/PGE-RES/PGE-RES.htm

Teri Murphy
University of Oklahoma

As of fall 2001, 58 percent of the undergraduate majors in the School of Industrial Engineering at the University of Oklahoma were women, a proportion strikingly higher than both the nationwide proportion in industrial engineering and the proportion in other STEM degree programs at the University of Oklahoma. Furthermore, the proportion more than doubled in the space of five years, having increased steadily from 27 percent in 1996. This phenomenon was especially puzzling because industrial engineering at the University of Oklahoma did not set out specifically to accomplish sex parity among its undergraduate majors. A multidisciplinary team of researchers investigated this phenomenon using an ethnographic research methodology, including interviews with students and faculty in the Industrial Engineering Department, in other STEM departments, and at other institutions. As expected, aspects of industrial engineering as a field were relevant to the achieved sex parity. However, a series of proactive efforts on the part of the department to advertise industrial engineering as a broad field may have also contributed to the recruitment of women. Furthermore, the achievement of sex parity at the undergraduate level was related to aspects of department culture that were visible to students and disproportionately meaningful to women, such as the passion of the faculty for the field and for working with students, elevated collegiality among the faculty, and the ability of women to succeed without compromising their femininity. Visit the program’s Web site to learn more about the project, and to view relevant publications and links.

02-25228 Grade level: undergraduate

WIDENING THE USE OF EFFECTIVE PRACTICES TO KEEP WOMEN IN COMPUTING

http://www.ncwit.org/

Lucinda Sanders
National Center for Women and Information Technology

The National Center for Women and Information Technology (NCWIT) is aiming to effect a significant and sustained increase in women’s enrollment in and graduation from information technology bachelor’s programs nationwide. Through its Unified Program of Change, the Center is creating an extension service with the initial objective of working with an existing coalition of academic departments. Known as the NCWIT Academic Alliance, the partners in this coalition will strive to implement practices that increase women’s participation in their programs. Visit NCWIT’s Web site to learn more about the project.

05-33580 Grade level: undergraduate
### EFFECTIVE STRATEGIES TO DIVERSIFY ACADEMIC STEM

<table>
<thead>
<tr>
<th>Lisa Frehill</th>
<th>Mary O’Connell</th>
<th>Elba Serrano</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Mexico State University</td>
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University deans and department heads play a critical role in bringing about reform at their institutions. Such officials must translate the broad goals outlined by high-level committees, such as boards of regents, into effective policy and results. For this reason, New Mexico State University assembled leading academic administrators from six Carnegie Doctoral/Research University institutions to develop a publication along with a PowerPoint presentation that synthesize—in an accessible format—existing literature on gender, race, and ethnicity as they relate to the recruitment of students and faculty in STEM. In doing so, they have assembled a set of effective, concrete strategies to increase participation of women and minorities in science and technology fields. Access the PDF and PowerPoint materials on the [Web site](http://diversefaculty.nmsu.edu/index.html), and learn more about what university faculty and administration can do to make better decisions regarding women and STEM.

04-36071 Grade level: undergraduate, graduate

### CIC WISE INITIATIVE

<table>
<thead>
<tr>
<th>Jean Girves</th>
<th>University of Illinois at Urbana–Champaign</th>
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Twelve universities collaborate on this Web site to share resources and offer educational opportunities for increasing the number of women pursuing STEM degrees and for supporting women faculty in advancing their careers. Online resources include links to a directory of women in science, technology, engineering, and mathematics; [Web sites](http://www.cic.uiuc.edu/groups/WISEPanel/) of participating schools; best-practices guidebooks; and an evaluation report on the outcomes of the CIC WISE Initiative.

95-55812 Grade level: undergraduate, graduate, professional development
### MENTORNET, THE E-MENTORING NETWORK FOR DIVERSITY IN ENGINEERING AND SCIENCE

http://www.mentornet.net

Carol Muller | San Jose State University Foundation

Finding time to be a mentor and to be mentored has become easy with MentorNet, the E-Mentoring Network for Diversity in Engineering and Science. Since 1997 this organization has offered award-winning, research-based, technology-leveraged mentoring programs that pair undergraduate and graduate students, postdocs, and early career faculty in engineering, sciences, and mathematics with scientific and technical professionals working in industry, government, and higher education, for structured, eight-month-long e-mail-based mentoring relationships. One-on-one encouragement and advice, online topic-based discussion groups, and a résumé database for job-seekers are just a few of the many benefits for MentorNet community members. MentorNet serves a growing partnership of institutions of higher education, corporations, government labs, and professional societies, all working together to create and sustain positive mentoring relationships on a large scale. The Web site also features links to evaluation reports.

00-01388 | Grade level: undergraduate, graduate, professional development

### TUTORIALS FOR CHANGE: GENDER SCHEMAS AND SCIENCE CAREERS

http://www.hunter.cuny.edu/gendertutorial/tutorials.htm

Virginia Valian | CUNY Hunter College

Four half-hour online tutorials use slides and voice-over narration to discuss the underrepresentation of women in STEM. Visit the Web site to read “Sex Disparities in Rank and Salary,” which reviews current data and common explanations. “Gender Schemas and Our Evaluations of Others” explains negative evaluations of women. “Gender Schemas and Our Evaluations of Ourselves” explains sex differences in entitlement. “Remedies: What You Can Do” suggests how students and faculty can improve diversity. The tutorials are useful for classrooms, workshops, and individuals.

01-20465 | Grade level: undergraduate, graduate, professional development
**ASSESSING WOMEN IN ENGINEERING**

http://aweonline.org

Rose Marra | University of Missouri–Columbia

Download a wide range of tools to develop and assess engineering outreach programs for girls. Web site includes survey instruments, data management software, research bibliographies, and much more, all designed to help institutions leverage their resources to benefit girls in engineering.

01-20642 | Grade level: undergraduate, professional development

**THE CRA DISTRIBUTED MENTOR PROJECT**

http://www.cra.org/Activities/craw/dmp/

Frederick Weingarten | Computing Research Association

Female computer science majors link to faculty mentors from across the country and chronicle their summers of mentorship in online journals. This Web site is also a comprehensive career guide for women pursuing graduate degrees in computer science: find program applications, awards listings, publications, research bibliographies, and links to allied organizations.

95-07756 | Grade level: undergraduate, professional development

**UNDERSTANDING WHAT KEEPS PEOPLE IN STEM**

http://web3.cas.usf.edu/main/depts/ANT/AAREA/STEM.html

Kathryn Borman | University of South Florida

At present, it is not well understood how the responses to school- and work-related experiences of individuals who pursue careers in STEM differ from those who do not. Researchers at the University of South Florida’s Alliance for Applied Research in Education and Anthropology (AAREA) are looking at results from two interrelated studies to understand how structural supports and barriers affect student outcomes, including students’ motivation to embark on STEM-career pathways. Combining and analyzing the results of these studies will provide information on the key background factors and experiences that affect STEM career persistence. Investigators will examine in detail the differences in career paths of individuals who have pursued different types of STEM careers. Both studies are informed by an interest in the economic outcomes of affirmative action policies in higher education. To learn more about the project, visit AAREA’s Web site.

03-37543 | Grade level: high school, undergraduate, graduate, professional development
### EXPANDING WOMEN’S OPPORTUNITIES THROUGH MATHEMATICAL SCIENCE

<table>
<thead>
<tr>
<th><a href="http://www.clas.niu.edu/ewoms/index.html">http://www.clas.niu.edu/ewoms/index.html</a></th>
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<tbody>
<tr>
<td>Amy Levin</td>
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</table>

Increase your institution’s retention of women in undergraduate calculus courses by replicating Northern Illinois University’s Expanding Women’s Opportunities through Mathematical Science program. Resources available on the Web site include teaching tools for female learners and a campus ad campaign that counters negative perceptions of women in math.

05-33486 | Grade level: undergraduate, professional development |

### FAIRERSCIENCE: MOVING BEYOND ANECDOTE TO INFORMED DISCUSSION

<table>
<thead>
<tr>
<th><a href="http://www.fairerscience.org">http://www.fairerscience.org</a></th>
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<tr>
<td>Susan Bailey</td>
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</table>

Wellesley College and Campbell-Kibler Associates

Through their work at www.FairerScience.org, the Wellesley Centers for Women at Wellesley College and Campbell-Kibler Associates seek to help researchers in gender and the sciences better communicate their work to the media, policymakers, and advocates while helping the media better understand issues associated with gender and STEM. The Web site, www.FairerScience.org, includes a variety of materials to do this, such as tips sheets, multimedia segment, links to resources, and a blog.

05-33486 | Grade level: undergraduate and beyond |

### WOMEN AND SCIENTIFIC LITERACY: BUILDING TWO-WAY STREETS

<table>
<thead>
<tr>
<th><a href="http://www.aacu.org/womenscllit/index.cfm">http://www.aacu.org/womenscllit/index.cfm</a></th>
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<tr>
<td>Caryn McTighe Musil</td>
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</table>

Curricular tools bridge the gap between STEM and women’s studies. This Web site includes sample science syllabi that integrate gender issues and sample women’s-studies syllabi that integrate science content, as well as an extensive bibliography of resources.

95-55808 | Grade level: undergraduate, professional development |
<table>
<thead>
<tr>
<th>Web Site</th>
<th>Description</th>
<th>Grade level</th>
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<tbody>
<tr>
<td><a href="http://equity.tamu.edu">Gender Equity Project: Changing Faculty Through Learning Communities</a></td>
<td>This <a href="http://equity.tamu.edu">website</a> helps STEM faculty explore deep-seated attitudes toward women in these fields. Downloadable syllabi model faculty development seminars in four areas: making STEM inviting to women, investigating how faculty preconceptions affect students' performance, determining personal vision, and changing the culture of STEM. The site includes links to “learning communities” research.</td>
<td>graduate, postgraduate, professional development</td>
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<tr>
<td><a href="http://www.pugetsoundcenter.org/ngcp">The National Girls Collaborative Project</a></td>
<td>At this <a href="http://www.pugetsoundcenter.org/ngcp">website</a>, advocates of girls’ STEM education and after-school programs can share ideas and information with organizations across the United States. It is a tremendous networking resource. New to the network? Click on the Northwest Girls Collaborative Project link for an introduction to the collaborative model.</td>
<td>professional development</td>
</tr>
<tr>
<td><a href="http://www.afterschool.org/sga/">Science, Gender, and Afterschool Community of Practice</a></td>
<td>More than just a <a href="http://www.afterschool.org/sga/">website</a>, this online community hosts a listserv and dialogue forum and regularly updates its resources for research into the innovative field of after-school girls’ science education. Keep up with the latest ideas in informal educational practices and exchange insights with educators from across the country.</td>
<td>professional development</td>
</tr>
</tbody>
</table>
### WOMEN IN CHEMICAL BUSINESS AND INDUSTRY

http://www.education.umd.edu/EDCP/enhance_site/

Ruth Fassinger  
University of Maryland–College Park

Much research has explored why women are underrepresented in academic STEM settings, but there are virtually no data regarding why women fail to enter industrial settings in predictable numbers or what happens to women who do. Moreover, little is known about the prevalence or effectiveness of strategies currently used to address the scarcity of women in industry. Through Project ENHANCE, investigators at the University of Maryland–College Park are seeking to understand the experiences of women scientists and engineers. Project ENHANCE uses the chemical industry as a model sector to document and analyze the career paths of women formally trained in science and engineering and then identify effective corporate practices for recruiting, retaining, and promoting women. Preliminary study results are available at the Project ENHANCE Web site, which also offers links to resources for women in science.

| 02-28007 | Grade level: professional development |

### WOMEN IN INFORMATION TECHNOLOGY: PIVOTAL TRANSITIONS FROM SCHOOL TO CAREERS

http://www.wit.clahs.vt.edu/

Carol Burger  
Virginia Polytechnic Institute and State College

What influences girls’ perceptions of choosing a career in information technology? How do family, peers, schools, and communities shape girls’ views of technology as friendly or unfriendly to them? K–12 and university educators and administrators learn about the transitional points in girls’ lives that affect their career choices. Research findings, success stories of women scientists, and links to science and education resources can be found on the Women in Technology Web site.

| 01-20458 | Grade level: professional development |

See also:
- Exploring Physics—Electricity and Magnetism (CD-ROMs)
- Audio Portraits of Women in STEM: HER-STORY CD Set (CD-ROMs)
- DragonflyTV: Sample Video Segments (DVDs/Videos and Games)
- You Can Be Anything! A Music Video to Encourage Girls and Women to Embrace Technology (DVDs/Videos and Games)
- Gender Differences in the Perception and Use of an Informal Science Learning Web Site: Final Report to the NSF (Publications)
- Science, Gender, and Afterschool: A Research-Action Agenda (Publications)
- After-School Science PLUS (Publications)
### Audio

#### Transforming the Role of Women and Girls in Science and Engineering

**To Order**
Visit the Web site at http://www.womeninscience.org

**Grant No.**
04-36130
03-32765
02-25030

**Principal Investigators**
- Glenn Busby (gbusby@wamc.org)
- Mary Darcy (mdarcy@wamc.org)

### CD-ROMs

#### Exploring Physics—Electricity and Magnetism

**To Order**
Visit the Web site at http://www.exploringphysics.com

**Grant No.**
94-50533

**Principal Investigator**
Meera Chandrasekhar (meerac@missouri.edu)

#### Seeing Gender: CD-ROM Set

**To Order**
Visit the Web site at http://www.meac.org/Resources/ed_services/SG_WEB/INDEX.htm

**Grant No.**
02-25184

**Principal Investigator**
Jacqueline Spears (jdspears@ksu.edu)

#### Audio Portraits of Women in STEM: HER-STORY CD Set

**To Order**
Visit the Web site at http://www.womeninscience.org

**Grant No.**
03-32765

**Principal Investigators**
- Glenn Busby (gbusby@wamc.org)
- Mary Darcy (mdarcy@wamc.org)

#### Introduction to 3-D Spatial Visualization: An Active Approach

**To Order**

**Grant No.**
04-29020

**Principal Investigator**
Sheryl Sorby (sheryl@mtu.edu)
### Powerful Signals: Transforming the Role of Women and Girls in Science and Engineering CD Set

**To Order**
Visit the Web site at http://www.womeninscience.org

| Grant No. | 03-32765 |

**Principal Investigators**
- Glenn Busby (gbusby@wamc.org)
- Mary Darcy (mdarcy@wamc.org)

### DVDs/Videos and Games

#### Dragonfly TV® Authentic Inquiry Videos

**To Order**
Visit the Web site at http://www.pbskids.org/dragonflytv

| Grant No. | 04-36260, 03-37350, 01-25738, 99-09828 |

**Principal Investigator**
- Richard Hudson (rhudson@tpt.org)

### Tech Savvy Girls Video and Resource Guide

**To Order**
The video is available through the Fairfax Network Video Store at:
http://www.fcps.edu/cpsapps/fairfaxnetwork/videostore/level2.cfm?ProductID=23

| Grant No. | 03-32841 |

**Principal Investigator**
- Nancy Lark
- No contact information available for former PI. Current contact at the American Association of University Women is Ashley Carr, in Media Relations, at carra@aauw.org

### Girls Creating Games

**To Order**
Visit the Web site at http://programservices.etr.org/gcgweb/

| Grant No. | 02-17221 |

**Principal Investigator**
- Jill Denner (jilid@etr.org)

### Girls Redesigning and Excelling in Advanced Technology

**To Order**
Visit the Web site at http://www.miamisci.org/great/index.html

| Grant No. | 01-14669 |

**Principal Investigator**
- Judy Brown (jabrown@miamisci.org)
| **You Can Be Anything!**  
**A Music Video to Encourage Girls and Women to Embrace Technology** |  |
| --- | --- |
| **To Order**  
Visit the Web site at  
http://www.umbc.edu/be-anything | **Grant No.**  
02-25079 |
| **Principal Investigator**  
Claudia Morrell (cmorrell@umbc.edu) |  |

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<tr>
<th><strong>The Case of Missing Human Potential</strong></th>
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| **To Order**  
Visit the Web site at  
http://www.missingpotential.org/ | **Grant No.**  
02-17109 |
| Or write to  
Missing Potential Video  
1375 Euclid Ave  
Cleveland, OH 44115-1835 |  |
| Or call (216) 916-6354 |  |
| **Principal Investigator**  
Frank Wilson (frank.wilson@ideastream.org) |  |

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<td><strong>After-School Science PLUS</strong></td>
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| **To Order**  
Visit the Web site at  
http://edequity.org/afterschool_materials.php | **Grant No.**  
96-32241 |
| **Principal Investigator**  
Barbara Sprung (bsprung@aed.org) |  |

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<th><strong>FIRST (Female Involvement in Real Science Technology)</strong></th>
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| **To Order**  
Visit the Web site at  
http://www.chabotspace.org/visit/programs/first.asp | **Grant No.**  
95-55807 |
| Or call (510) 336-7382 to order the Girls FIRST resource guide |  |
| **Principal Investigator**  
Etta Heber (eheber@chabotspace.org) |  |
National Science Partnership for Girl Scouts and Science Museums

To Order
Visit the Web site at
http://www.fi.edu/tfi/programs/nsp.html

Principal Investigator
Dale McCreedy (mccreedy@fi.edu)

Grant No.
04-36249

Sport Science: Using Sports as a Vehicle for Science Learning

To Order
Type in the URL to view the report directly:

Principal Investigator
Penny Hammrich (penny_hammrich@qu.cuny.edu)

Grant No.
00-02073

Learning Online

To Order
Type in the URL to view the report directly:
http://www2.edc.org/GDI/publications_SR/equity6_04_FULLBOOK.pdf

Principal Investigator
Katherine Hanson (khanson@edc.org)

Grant No.
00-02126

Athena Project

To Order
Type in the URL to view the newsletter directly:
http://www.alphacenter.ucr.edu/Brochures/VolumeI_Issue1.pdf

Principal Investigator
Pamela Clute (pamela.clute@ucr.edu)

Grant No.
96-19060

United Connecticut for Women in Science, Engineering, and Mathematics

To Order
Visit the Web site at
http://www.easternct.edu/personal/faculty/cidc/ucwsme.html

Principal Investigator
Carmen Cid (cid@easternct.edu)

Grant No.
94-50026
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<th>Title</th>
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| **Beyond the Beakers: SMART Advice on Entering Graduate Programs in the Sciences and Engineering** | **To Order**
Visit the Web site at http://www.bcm.edu/smart/?PMID=2993                                                                 | **Principal Investigator**
Gayle R. Slaughter (gayles@bcm.tmc.edu) | **99-06394**
**00-80662** |
| **Retention of Women Graduate Students and Early Career Academics in Science and Engineering** | **To Order**
Jill Bystydzienski (bystydj@iastate.edu) | **00-94556** |
| **Removing Barriers: Women in Academic Science, Technology, Engineering, and Mathematics** | **To Order**
Jill Bystydzienski (bystydj@iastate.edu)
Sharon R. Bird (eds.) | **00-94556** |
| **Achieving Gender Equity in Classrooms: A Guide for Faculty**       | **To Order**
Type in the URL to view the handbook directly: http://www.brown.edu/Administration/Dean_of_the_College/homepginfo/equity/Equity_handbook.html | **Principal Investigator**
Sheila E. Blumstein (sheila_blumstein@brown.edu) | **94-53676** |
| **The Preparation of Gender-Sensitive Science Teachers in the University of Delaware’s Secondary Science Education Program** | **To Order**
Type in the URL to view the resource guide directly: http://www.nsta.org/main/pdfs/NSTAsstandards2003.pdf | **Principal Investigator**
Kathryn Scantlebury (kscantle@udel.edu) | **94-5022** |
<table>
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<tr>
<th>Title</th>
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<th>Grant No.</th>
<th>Principal Investigator</th>
<th>Visit the Web site at</th>
<th>Email Address</th>
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<tr>
<td><strong>Northwest Girls Collaborative Project Replication Guide</strong></td>
<td>To Order</td>
<td>02-17212</td>
<td>Karen Peterson (<a href="mailto:kpeterson@pugetsoundcenter.org">kpeterson@pugetsoundcenter.org</a>)</td>
<td><a href="http://www.pugetsoundcenter.org/ngcp/nwgcp/">http://www.pugetsoundcenter.org/ngcp/nwgcp/</a></td>
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<td><strong>Science, Gender, and Afterschool: A Research-Action Agenda</strong></td>
<td>To Order</td>
<td>04-10552</td>
<td>Merle Froschl (<a href="mailto:mfroschl@aed.org">mfroschl@aed.org</a>)</td>
<td><a href="http://www.afterschool.org/sga">http://www.afterschool.org/sga</a></td>
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<tr>
<td><strong>Tech Savvy: Educating Girls in the New Computer Age</strong></td>
<td>To Order</td>
<td>03-32841</td>
<td>Nancy Lark</td>
<td><a href="http://www.aauw.org/research/girls_education/techsavvy.cfm">http://www.aauw.org/research/girls_education/techsavvy.cfm</a></td>
<td><a href="mailto:carra@aauw.org">carra@aauw.org</a></td>
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<tr>
<td><strong>Under the Microscope: A Decade of Gender Equity Projects in the Sciences</strong></td>
<td>To Order</td>
<td>03-32841</td>
<td>Nancy Lark</td>
<td><a href="http://qcpages.qc.cuny.edu/Education/new/sisnewsletter.html">http://qcpages.qc.cuny.edu/Education/new/sisnewsletter.html</a></td>
<td><a href="mailto:casr@qu.cuny.edu">casr@qu.cuny.edu</a></td>
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<tr>
<td><strong>Sisters in Science Newsletter</strong></td>
<td>To Order</td>
<td>04-36221</td>
<td>Penny Hammrich (<a href="mailto:penny_hammrich@qu.cuny.edu">penny_hammrich@qu.cuny.edu</a>)</td>
<td><a href="http://qcpages.qc.cuny.edu/Education/new/sisnewsletter.html">http://qcpages.qc.cuny.edu/Education/new/sisnewsletter.html</a></td>
<td></td>
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### Gender Differences in the Perception and Use of an Informal Science Learning Web Site: Final Report to the NSF

**To Order**
Type in the URL to view the report directly:
[http://capsi.caltech.edu/research/documents/GenderDifferencesAschbacher_000.pdf](http://capsi.caltech.edu/research/documents/GenderDifferencesAschbacher_000.pdf)

**Principal Investigator**
Pamela Aschbacher (pama@caltech.edu)

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<th>Grant No.</th>
<th>00-86338</th>
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### Web Sites

**Explanatoids**

**To Order**
Visit the Web site at
[http://www.explanatoids.com](http://www.explanatoids.com)

**Principal Investigator**
Janet Stocks (stocks@andrew.cmu.edu)

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<tr>
<th>Grant No.</th>
<th>02-17033</th>
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### Imagination Place!

**To Order**
Visit the Web site at
[http://www.edc.org/CCT/imagination_place/](http://www.edc.org/CCT/imagination_place/)

**Principal Investigator**
Jessica Drummer Ryan (info@girlsinc-alameda.org)

<table>
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<tr>
<th>Grant No.</th>
<th>97-14749</th>
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### Computer Game Design: Involving Girls

**To Order**
Visit the Web site at
[http://gel.msu.edu/lifepreservers](http://gel.msu.edu/lifepreservers)
[http://aliengames.org](http://aliengames.org)

**Principal Investigator**
Carrie Heeter (heeter@msu.edu)

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<th>Grant No.</th>
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### Gaining Confidence in Math: Intelligent Tutors With Custom Design for Girls

**To Order**
Visit the Web site at

**Principal Investigator**
Carol Beal (cbeal@isi.edu)

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<tr>
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### The Image of Engineering and Imaginary Lines: Engaging Girls

**To Order**  
Visit the Web site at  
http://www.sallyridescience.com/  

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<td>04-36230</td>
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**Principal Investigators**  
Tam O'Shaughnessy (toshaugh@mail.sdsu.edu)  
Sally Ride  

### Through the Glass Wall

**To Order**  
Visit the Web site at  
http://mathequity.terc.edu/gw/html/web.html  

<table>
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**Principal Investigator**  
Andee Rubin (andee_rubin@terc.edu)  

### Girls' Science Practices in Urban, High-Poverty Communities

**To Order**  
Visit the Web site at  
http://ed-web3.educ.msu.edu/CalabreseBarton/urban.girls.html  

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**Principal Investigator**  
Angela Calabrese Barton (acb@msu.edu)  

### Hear Our Voices and the Computer Clubhouse

**To Order**  
Visit the Web site at  

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**Principal Investigator**  
Gail Breslow (gbreslow@mos.org)  

### STEMTeams.org

**To Order**  
Visit the Web site at  
http://stemteams.org  

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**Principal Investigator**  
Katherine Ziemer (kziemer@coe.neu.edu)
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<th>Project Title</th>
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<tr>
<td>Telementoring Young Women in Engineering and Computing: Providing the Vital Link</td>
<td>Margaret Honey</td>
<td><a href="http://www.edc.org/CCT/telementoring/index2.html">http://www.edc.org/CCT/telementoring/index2.html</a></td>
<td>94-50042</td>
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<tr>
<td>Think Again . . . Girls Can!</td>
<td>Janice A. Grackin</td>
<td><a href="http://www.girlscan.org">http://www.girlscan.org</a></td>
<td>02-17200</td>
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<td>Midwest Rural–Urban Girls Collaborative</td>
<td>Paula Kemp</td>
<td><a href="http://www.missouristate.edu/mru/home">http://www.missouristate.edu/mru/home</a></td>
<td>05-33581</td>
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<tr>
<td>After-School and Summer Science Camps for Young Women</td>
<td>Sylvia Oliver</td>
<td><a href="http://www.spokanecitylab.wsu.edu">http://www.spokanecitylab.wsu.edu</a></td>
<td>00-86440</td>
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<tr>
<td>Aiming for Algebra</td>
<td>Rachel Muir</td>
<td><a href="http://www.clubgirlstart.org/">http://www.clubgirlstart.org/</a></td>
<td>02-17038</td>
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### Can Robotics Keep Girls in Science?

**To Order**
Visit the Web site at  
http://www.botball.org/

**Principal Investigator**
Jerry Weinberg (jweinbe@siue.edu)

**Grant No.**
05-22400

---

### Computer Programming for Middle School Girls

**To Order**
Visit the Web site at  
http://www.rapunsel.org/

**Principal Investigator**
Kenneth Perlin (perlin@mrl.nyu.edu)

**Grant No.**
03-32898

---

### Girls Dig It

**To Order**
Visit the Web site at  
http://www.nyu.edu/classes/mcgee/digit/  
http://www.girlsinc.org/

**Principal Investigator**
Heather Johnson Nicholson (hjnicolson@girls-inc.org)

**Grant No.**
99-08759

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### Girls in Engineering Hands-On Museum Exhibit Development

**To Order**
Visit the Web site at  
http://engineering.tufts.edu/ggs/proginfo.htm

**Principal Investigator**
Ioannis Miaoulis (imiaoulis@mos.org)

**Grant No.**
96-32175

---

### Go-Girl: Gaining Options—Girls Investigate Real Life

**To Order**
Visit the Web site at  
http://www.gogirls.wayne.edu  
http://www.smartgirl.org

**Principal Investigator**
Pamela T. Reid (preid@roosevelt.edu)

**Grant No.**
01-14683  
05-07902
### Media Literacy Training for Middle School Students

**To Order**  
**Grant No.** 04-29005  
**Principal Investigator**  
Jocelyn Steinke (jocelyn.steinke@wmich.edu)

### Tech Team: Project-Based Education for Middle School Girls

**To Order**  
Visit the Web site at [http://www.knowitall.org/techteam](http://www.knowitall.org/techteam)  
**Grant No.** 02-17199  
**Principal Investigator**  
Betsy Newman (bnewman@scetv.org)

### The National Science Partnership for Girl Scouts and Science Museums

**To Order**  
Visit the Web site at [http://sln.fi.edu/tfi/programs/nsp.html#top](http://sln.fi.edu/tfi/programs/nsp.html#top)  
**Grant No.** 04-36249  
**Principal Investigator**  
Dale McCreedy (mccreedy@fi.edu)

### Science on Patrol

**To Order**  
**Grant No.** 02-17188  
**Principal Investigator**  
Bonnie Brownstein (bonniebrownstein@aol.com)

### Women Who Walk Through Time

**To Order**  
Visit the Web site at [http://www.earth.utah.edu/women](http://www.earth.utah.edu/women)  
**Grant No.** 96-25566  
**Principal Investigator**  
Marjorie Chan (chan@earth.utah.edu)
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<tr>
<td>Challenging Gender Stereotypes With Computer-Based Social Models</td>
<td>Amy Baylor (<a href="mailto:Baylor@fsu.edu">Baylor@fsu.edu</a>)</td>
<td>04-29647</td>
<td><a href="http://ritl.fsu.edu/_Website/projectsPals.asp">http://ritl.fsu.edu/_Website/projectsPals.asp</a></td>
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<td>Gender-Based Science Performance Models</td>
<td>Ronald Stevens (<a href="mailto:immexron@earthlink.net">immexron@earthlink.net</a>)</td>
<td>04-29156</td>
<td><a href="http://www.immex.ucla.edu">http://www.immex.ucla.edu</a></td>
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<tr>
<td>The Case of Missing Human Potential</td>
<td>Frank Wilson (<a href="mailto:frank.wilson@ideastream.org">frank.wilson@ideastream.org</a>)</td>
<td>02-17109</td>
<td><a href="http://www.missingpotential.org/">http://www.missingpotential.org/</a></td>
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<td>United Connecticut for Women in Science, Engineering, and Mathematics</td>
<td>Carmen Cid (<a href="mailto:cid@easternct.edu">cid@easternct.edu</a>)</td>
<td>94-50026</td>
<td><a href="http://www.easternct.edu/personal/faculty/cidc/ucwsme.html">http://www.easternct.edu/personal/faculty/cidc/ucwsme.html</a> <a href="http://www.cpep.org/index.html">http://www.cpep.org/index.html</a></td>
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### Engineering, Science, and Math Increase Job Aspirations (ES MIJA)

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Look under “Publications” for the report “Minority Women in Science: Forging the Way.”

Or type in this URL to access the report directly:
http://www.idra.org/page.shop.product_details/flypage.shop.flypage/product_id,22/category_id,1/manufacturer_id,0/option,com_virtuemart/Itemid,301/

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<tr>
<td>Maria “Cuca” Robledo Montecel</td>
<td>No contact information available for former PI. Current contact at IDRA is Bradley Scott, IDRA’s senior education associate and director of the South Central Collaborative for Equity at <a href="mailto:bradley.scott@idrea.org">bradley.scott@idrea.org</a>.</td>
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### Women in Science and Engineering (WISE)

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<td>Visit the Web site at <a href="http://www.wise.sunysb.edu">http://www.wise.sunysb.edu</a></td>
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<th>Principal Investigator</th>
<th>No contact information available for former PI. Current contact at WISE is Director Carrie-Ann Miller at <a href="mailto:camiller@notes.cc.sunysb.edu">camiller@notes.cc.sunysb.edu</a></th>
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<td>Edith Steinfield</td>
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### Opening the Horizon: Strengthening Science Education for Middle School Girls in Rural Southwest Missouri

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<td>Paula Kemp (<a href="mailto:paulakemp@missouristate.edu">paulakemp@missouristate.edu</a>)</td>
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### Techbridge

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<td>Visit the Web site at <a href="http://www.techbridgegirls.org">http://www.techbridgegirls.org</a></td>
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<tr>
<td>Etta Heber (<a href="mailto:eheber@chabotspace.org">eheber@chabotspace.org</a>)</td>
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### Bioinformatics Initiative for High School Students

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<td>Visit the Web site at <a href="http://www.immaculata.edu/bioinformatics/">http://www.immaculata.edu/bioinformatics/</a></td>
<td>00-86360</td>
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**Principal Investigator**

Susan Cronin (scronin@immaculata.edu)

### The Computational Laboratory

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<td>Visit the Web site at <a href="http://tangent.krellinst.org/scied/">http://tangent.krellinst.org/scied/</a></td>
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**Principal Investigator**

Margaret Honey (mhoney@edc.org)

### Discovery Under the Hood

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<td>Visit the Web site at <a href="http://discoveryunderthehood.com/">http://discoveryunderthehood.com/</a></td>
<td>02-17146</td>
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**Principal Investigator**

Mary Parks (meparks@mail.colgate.edu)

### Improving Girls’ Self-Efficacy With Virtual Peers

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**Principal Investigator**

Yanghee Kim (yangheekim@cc.usu.edu)

### Programming With a Purpose

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<td>Visit the Web site at <a href="http://cct.edc.org/project_summary.asp?numProjectId=3008">http://cct.edc.org/project_summary.asp?numProjectId=3008</a></td>
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**Principal Investigator**

Cornelia Brunner (cbrunner@edc.org)
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<td>Social Context and Gender Differences in STEM</td>
<td>Visit the Web site at <a href="http://www.prc.utexas.edu/ahaa/index.html">http://www.prc.utexas.edu/ahaa/index.html</a></td>
<td>Chandra Muller (<a href="mailto:cmuller@mail.la.utexas.edu">cmuller@mail.la.utexas.edu</a>)</td>
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<td>Wayang Outpost: Virtual Tutoring for High Stakes Math Achievement Tests</td>
<td>Visit the Web site at <a href="http://k12.usc.edu">http://k12.usc.edu</a></td>
<td>Carole Beal (<a href="mailto:cbeal@isi.edu">cbeal@isi.edu</a>)</td>
<td>04-29125</td>
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<td>Connecting Women Across the Computer Science Pipeline: From High School</td>
<td>Visit the Web site at <a href="http://www.scu.edu/SCU/Projects/NSFWorkshop99/html/walker.html">http://www.scu.edu/SCU/Projects/NSFWorkshop99/html/walker.html</a> Or type in this URL to directly access the report: <a href="http://www.cs.duke.edu/csed/rodger/papers/necc.pdf">http://www.cs.duke.edu/csed/rodger/papers/necc.pdf</a></td>
<td>Ellen Walker (<a href="mailto:walkerel@hiram.edu">walkerel@hiram.edu</a>)</td>
<td>94-50007</td>
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<td>Connecting Women Across the Computer Science Pipeline: From High School</td>
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<td>Diversity in Physics: Learning From Women’s Colleges What Works</td>
<td>Visit the Web site at <a href="http://www.coloradocollege.edu/dept/PC/WhatWorks2004/web%20pages/Home.htm">http://www.coloradocollege.edu/dept/PC/WhatWorks2004/web%20pages/Home.htm</a></td>
<td>Barbara Whitten (<a href="mailto:bwhitten@coloradocollege.edu">bwhitten@coloradocollege.edu</a>)</td>
<td>03-32874 01-20450</td>
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<td>Pathway to a STEM Baccalaureate Degree: Research Trends, Exemplary Practices, and Successful Strategies</td>
<td>Visit the Web site at <a href="http://www.pathway2stemdegree.org">http://www.pathway2stemdegree.org</a></td>
<td>Frankie Santos Laanan (<a href="mailto:laanan@iastate.edu">laanan@iastate.edu</a>)</td>
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<td><strong>Summer Medical and Research Training Program</strong></td>
<td>Gayle R. Slaughter (<a href="mailto:gayles@bcm.tmc.edu">gayles@bcm.tmc.edu</a>)</td>
<td>00-80662</td>
<td>Visit the Web site at <a href="http://www.bcm.edu/smart/?PMID=0">http://www.bcm.edu/smart/?PMID=0</a></td>
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<tr>
<td><strong>Why Does It Work? A Study of Successful Gender Equity in Industrial</strong></td>
<td>Teri Murphy (<a href="mailto:tjmurphy@ou.edu">tjmurphy@ou.edu</a>)</td>
<td>02-25228</td>
<td>Visit the Web site at <a href="http://www.ou.edu/rise/Publication/PGE-RES/PGE-RES.htm">http://www.ou.edu/rise/Publication/PGE-RES/PGE-RES.htm</a></td>
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<td><strong>Widening the Use of Effective Practices to Keep Women in</strong></td>
<td>Lucinda Sanders (<a href="mailto:lucinda.sanders@colorado.edu">lucinda.sanders@colorado.edu</a>)</td>
<td>05-33580</td>
<td>Visit the Web site at <a href="http://www.ncwit.org/">http://www.ncwit.org/</a></td>
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<tr>
<td><strong>Effective Strategies to Diversify Academic STEM</strong></td>
<td>Lisa Frehill (<a href="mailto:lfrehill@nmsu.edu">lfrehill@nmsu.edu</a>) Mary O’Connell Elba Serrano</td>
<td>04-36071</td>
<td>Visit the Web site at <a href="http://diversefaculty.nmsu.edu/index.html">http://diversefaculty.nmsu.edu/index.html</a></td>
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<tr>
<td><strong>CIC WISE Initiative</strong></td>
<td>Jean Girves No contact information available for former PI. Current contact at the CIC is Director Barbara S. Clark, <a href="mailto:barbclark@purdue.edu">barbclark@purdue.edu</a></td>
<td>95-55812</td>
<td>Visit the Web site at <a href="http://www.cic.uiuc.edu/groups/WISEPanel/">http://www.cic.uiuc.edu/groups/WISEPanel/</a></td>
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<td>Mentornet, the E-Mentoring Network for Diversity in Engineering and Science</td>
<td>Visit the Web site at <a href="http://www.mentornet.net">http://www.mentornet.net</a></td>
<td>Carol Muller (<a href="mailto:cbmuller@mentornet.net">cbmuller@mentornet.net</a>)</td>
<td>00-01388</td>
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<tr>
<td>Tutorials for Change: Gender Schemas and Science Careers</td>
<td>Visit the Web site at <a href="http://web3.cas.usf.edu/main/depts/ANT/AAREA/STEM.html">http://web3.cas.usf.edu/main/depts/ANT/AAREA/STEM.html</a></td>
<td>Virginia Valian (<a href="mailto:vvvhc@cunyvm.cuny.edu">vvvhc@cunyvm.cuny.edu</a>)</td>
<td>01-20465</td>
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<td>Understanding What Keeps Women in STEM</td>
<td>Visit the Web site at <a href="http://web3.cas.usf.edu/main/depts/ANT/AAREA/STEM.html">http://web3.cas.usf.edu/main/depts/ANT/AAREA/STEM.html</a></td>
<td>Kathryn Borman (<a href="mailto:kborman813@aol.com">kborman813@aol.com</a>)</td>
<td>03-37543</td>
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<td>Assessing Women in Engineering</td>
<td>Visit the Web site at <a href="http://aweonline.org">http://aweonline.org</a></td>
<td>Rose Marra (<a href="mailto:rmarra@missouristate.edu">rmarra@missouristate.edu</a>)</td>
<td>01-20642</td>
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<td>The CRA Distributed Mentor Project</td>
<td>Visit the Web site at <a href="http://www.cra.org/Activities/craw/dmp/">http://www.cra.org/Activities/craw/dmp/</a></td>
<td>Frederick Weingarten (<a href="mailto:rweingarten@alawash.org">rweingarten@alawash.org</a>)</td>
<td>95-07756</td>
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</tbody>
</table>
# Expanding Women’s Opportunities Through Mathematical Science

**To Order**
Visit the Web site at http://www.clas.niu.edu/ewoms/index.html

**Principal Investigators**
Amy Levin (alevin@niu.edu)  
Danielle Steele

**Grant No.**
00-86310

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# FairerScience: Moving Beyond Anecdote to Informed Discussion

**To Order**
Visit the Web site at http://www.fairerscience.org

**Principal Investigators**
Susan Bailey (wcw@wellesley.edu)  
Patricia Campbell (campbell@campbell-kibler.com)

**Grant No.**
05-33486

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# Women and Scientific Literacy: Building Two-Way Streets

**To Order**
Visit the Web site at http://www.aacu.org/womensclilit/index.cfm

**Principal Investigator**
Caryn McTughe Musil (musil@aacu.nw.dc.us)

**Grant No.**
95-55808

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# Gender Equity Project: Changing Faculty Through Learning Communities

**To Order**
Visit the Web site at http://equity.tamu.edu

**Principal Investigator**
Karen Watson (watson@tamu.edu)

**Grant No.**
01-20825

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# The National Girls Collaborative Project

**To Order**
Visit the Web site at http://www.pugetsoundcenter.org/ngcp

**Principal Investigator**
Karen Peterson (kpeterson@pugetsoundcenter.org)

**Grant No.**
02-17212
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<td><strong>Principal Investigator</strong></td>
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<tr>
<td>Merle Froschl (<a href="mailto:mfroschl@aed.org">mfroschl@aed.org</a>)</td>
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<td><strong>Principal Investigator</strong></td>
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<tr>
<td>Ruth Fassinger (<a href="mailto:rfassinger@umd.edu">rfassinger@umd.edu</a>)</td>
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<td><strong>Grant No.</strong></td>
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<p>| <strong>Women in Information Technology (WIT):</strong>              |</p>
<table>
<thead>
<tr>
<th>Pivotal Transitions From School to Careers</th>
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<td><strong>To Order</strong></td>
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<td>Visit the Web site at</td>
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<tr>
<td><a href="http://www.wit.clahs.vt.edu/">http://www.wit.clahs.vt.edu/</a></td>
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<tr>
<td><strong>Principal Investigator</strong></td>
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<tr>
<td>Carol Burger (<a href="mailto:cjburger@vt.edu">cjburger@vt.edu</a>)</td>
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<td><strong>Grant No.</strong></td>
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