

Strategies and Resources to Promote Success in Math

In today's economy, mathematics and science literacy are critical for economic survival and success. Women represent 46% of the total U.S. workforce¹ but they are only about 28% of the computer system design engineers, and 16 % of chemical engineers². Early interest in science, math, technology, and engineering is critical to girls' academic achievement; however, when compared to other countries, U.S. students rank near the bottom in these subjects. For many, competence in these subjects is the key to success in the market place.

Tips for Encouraging Females in Math

Use these criteria to be sure that math activities are equitable:

- ✓ • The instructor is enthusiastic and has equal expectations for all students
- ✓ • Written materials and verbal instructions use gender free language
- ✓ • Activities relevant to students' lives are stressed
- ✓ • "Hands-on" experience is required from all students
- ✓ • Problems do not always demand one "right" answer.
- ✓ • Relevant career information relevant is presented.
- ✓ Examples of female role models are included.

Strategies for Teachers

- ✓ Use the same standards for math performance regardless of the student's gender.
- ✓ Have the students do activities like constructing a model or making bread to learn math rather than just reading problems or doing worksheets.
- ✓ Develop in-service programs to introduce new math concepts and teaching techniques.
- ✓ De-emphasize the "oddity" for females who do well in math or males who do not do well in math.
- ✓ Make short biographies of women and men mathematicians available in the classroom, either from books and articles or by providing links to information on the internet.
- ✓ Invite women and men to visit your class to talk about their math related jobs and the preparation needed for those jobs.
- ✓ Work with your school counselor to see that good, non-biased career technical education information about all the math-related occupations is available.
- ✓ Examine your classroom, textbooks, lesson plans, for stereotypic attitudes, opinions and activities.

¹ United States Department of Labor Statistics and Data, Quick Stats 2007, www.dol.gov/wb

² United States Department of Labor Statistics and Data, Nontraditional Occupations for Women, www.dol.gov/wb

Skills Needed In Math

Classroom Activity

Ask students to brainstorm a list of skills that are needed in solving math problems. Highlight the fact that rote memorization, alone, will not lead to success in math. Here are some suggestions, many more are possible:

1. analysis
2. clear communication
3. curiosity
4. design
5. focus
6. intuition
7. logic
8. memorization
9. meta-cognition (knowledge about your own thinking)
10. multiple perspectives
11. persistence
12. practical applications
13. resourcefulness
14. symbolism
15. understanding fundamental concepts
16. holistic thinking

Internet Resources To Promote Math Skills

Here are some resources to assist you in developing students' math skills.

Knot a Braid of Links (KaBoL) <http://www.cms.math.ca/Kabol/> This page provides a "cool math site of the week" service to the mathematics community by the Canadian Mathematical Society. Since it was launched in 1996, KaBoL has featured hundreds of valuable math pages. It has a variety of links and math exercises that will challenge, educate and even entertain you and the most resistant math phobic.

Hotmath.com www.hotmath.com This commercial site provides step-by-step explanations of actual math homework problems in math textbooks (odd-numbered problems only). The site provides help with middle school math homework, pre-algebra homework, algebra homework, geometry homework, pre-calculus homework, and calculus homework.

Expanding Your Horizons Network <http://www.expandingyourhorizons.org> Expanding Your Horizons is a nonprofit organization that seeks to encourage young women to pursue science, technology, engineering and mathematics (STEM) careers. The website has a variety of resources to promote and support exploration in these areas.

The Math Forum at Drexel University provides an array of resources in mathematics. • <http://mathforum.org/~sarah/Discussion.Sessions/biblio.attitudes.html> is an annotated bibliography of "Girls' Attitudes, Self-Expectations, and Performance in Math."

Science Net Links <http://www.sciencenetlinks.com> is hosted by the American Association for the Advancement of Science with foundation funding. It provides a wealth of resources including lessons and website links for teachers to promote learning in science.

Encouraging Girls in Math And Science <http://ies.ed.gov/ncee/wwc/pdf/20072003.pdf> is an Institute of Education Sciences Practice Guide, United States Department of Education publication of recommendations to encourage girls in math and science.

The PDK Poster Project <http://www.pdksciart.com/> offers a series of colorful posters portraying women in science. The posters cost \$30 each. Math-related materials at the high school level associated with the posters are also available.

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