Educatíng Girls in Math and Science

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Earth Life and Time
Cell Biology and Molecular Genetics
French Studies

Program: Girls Excelling in Math and Science
Since 2006 Girls Excelling in Math and Science, GEMS, has been working to educate middle school girls in math and science through engaging science experiments. GEMS mentors work to show girls that there is a place for them in these career fields. Currently GEMS can be found at William Wirt, Hyattsville Middle School and Nicholas Orem
Coordinator: Mrs. Eddie Crocker, edcrocker3@verizon.net

Difficulties
The voice of women, especially minority women, is frequently forgotten in the scientific field as early as middle school. The majority of the girls in the Hyattsville Middle School chapter of GEMS are minority students. These girls are at a disadvantage because they do not have role models to prove that it is possible for them to enter these fields.

Activities
Beginning in the Fall of 2009 for two hours every Wednesday afternoon Mrs. Crocker, 3 mentors and I work with about 12 girls ranging from the ages of 11 to 13. We begin each session with snacks and a transition period. We then work on math worksheets pertaining to the daily activities.

Themes:
• Electrochemistry
• Kitchen Chemistry
  • The first week of Kitchen Chemistry we worked to determine the cause of the exothermic reaction produced by phenol red solution, sodium bicarbonate and sodium chloride, which can be found in ice melt.
  • During week two we utilized red cabbage as a pH indicator for household items such as vinegar, ammonia, lemon juice and sprite. We also used iodine to determine which fruits and vegetables contain starch.
  • Our last week of Kitchen Chemistry we experimented glycerol to make extremely large bubbles.
• Engineering
  • We spent several sessions building cardboard roller coasters and discussing the physics of the project.
• Atmospheric Sciences
  • In small groups we read a small booklet on the causes and consequences of global warming. After each group presented their topic we had a short group discussion on the relevance of global warming in our lives. To fully understand the effects of CO2 we created a global warming system in a coffee tin. Using three thermometers we were able to measure the heat released.
• Astrobiology
• Health and Nutrition
• Soil and Plant Science

Responsibilities:
As a GEMS mentor I,
• Attend weekly Monday meetings with all the GEMS mentors in preparation for sessions
• Prepare and review presentations and activities for the week
• Work as lead mentor
• Perform scientific demonstrations
• Observe and assist students working on scientific experiments
• Organize and clean up each activity
• Share personal experiences about high school and college
• Write a weekly reflection to determine problems and solutions

Impact:
All these girls need is a passionate role model so that they can understand that this is a possibility, it just takes work. The girls I work with are loud, rambunctious and most importantly enthusiastic. I love walking into that school and seeing so much excitement, life and diversity. I have learned to have patience to teach, because I began to feel personally responsible for their education. Every student deserves to understand the topics being taught. No matter how long or frustrating I work with each student so they may receive the personal attention necessary to excel in both math and science.

Personal Effect:
Although we are working with middle school students, we covered the topics that they will be seeing in high school. I love that the topics covered in GEMS quite frequently correlate to topics in my current classes. The little acronyms and tips used for GEMS definitely help me remember the basics of acids and bases or electricity. Most importantly I remembered to have fun with my education again!

This summer I would like to get involved in an organization involving adolescents interested in science. My new career plan now includes teaching abroad before graduate school. From one practicum project and one amazing group of girls I have decided to alter my career plans. I now have this urgent need to inspire diverse groups of women so that they too may enter the science and math fields. I hope GEMS the best and plan to support this organization in any way possible.

Future Work:
GEMS is an excellent program that gives these girls opportunities to experience the scientific field. Programs such as these should be implemented in all schools. Hopefully these girls will pursue a college degree and career in science. Ideally those girls will become the scientific role models of tomorrow.

I’d like to thank Mrs. Crocker for working so hard to help these girls succeed. My gratitude goes out to Dr. Rusca and Katherine Schmitt for assisting in the success of GEMS. To Ms. Joshi who has taught me a lot about teaching, Dr. Holtz and Dr. Merck, you have created a program that has made this campus feel like home. Thank you for your constant support and enthusiasm. Most importantly I’d like to thank the girls from Hyattsville Middle School who have taught me to be patient and to truly enjoy my education.