

# Making It Happen: Pizza Parties, Chemistry Goddesses & Other Strategies that Work for Girls and Others

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# Oh No, Not More Teacher Tips!

These are not your usual "teacher tips;" they are teacher-generated and teacher-used and work to involve girls, and boys, in math and science.

Not all the strategies work for all teachers. Teachers, like everyone else, come in many sizes, types and personalities. While the strategies reflect teacher styles and personalities, they do reflect some common beliefs including:

- the classroom environment must be respectful of individuals, both students and teachers.
- all students should participate in class.
- classrooms need to incorporate multiple modes of learning.

The strategies include an emphasis on gender equity. During the past twenty years there have been great gains for girls in math and science, but more is needed. For many girls, the problem is not in grades but in continuation. Even today, relatively few girls are going into math and physical science-related careers. Girls are still getting the message that while teaching math and science and doing biology are okay, careers that involve math or physical science are not for them.

Teachers are an important part of this process. Teachers can discourage in subtle as well as overt ways. They can perpetuate stereotypes with comments like "You're too pretty to be a math whiz," and they can reinforce the status quo by not challenging fellow teachers who feel girls don't belong in advanced math and science.

Teachers can encourage with activities that fight stereotypes. One class does this with "chemistry goddesses," others by taking time for individual students and by being excited about teaching and about their subject.

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# From Harassment to Respect: Changing Classroom Climates

I wish my teachers would stop students from putting down and making fun of one another. In the school I attend it seems there are very few students who respect one another and the teachers just sit back and don't tell the kids to stop. Why can't the teachers get more involved? It would make for a happier learning environment.

(Samara Devore, FreshVoices, Parade Magazine, March 27, 1994, page 29.)

There are several ways to make a happy learning environment happen.

## I. Have a policy about student "put downs." Sample policies include:

- The first time a student puts another student down in class, they are yelled at. The second time they are "thrown" out of class.
- The first time there is a put down in class, the student is told "we don't do that." The second time it is repeated more forcefully, and the third time the student is out.

## II. Turn the tables on the "put downer."

- Comment back to the student, but stay away from sarcasm. For example, if one makes a mean comment about another student who never talks, you might say, "and yet they are still doing better than you".
- Explain to the "put downer" what they have done to the other person and how that person might feel. Often students think about it and sometimes apologize.

## III. Watch your own actions.

- Use gender-inclusive language. When teachers use the male generic, students think only males do it. Use female pronouns and names in examples to send the message that both girls and boys do science and math.
- NEVER suggest that students not continue in math. If they want to drop, suggest that they drop a level instead of the course.
- Check if you treat girls and boys differently. Have another teacher observe you over a period of time or do some classroom videotaping to see what you're doing.

# We're All In This Together: Improving Classroom Interaction

I listen to what the girls have to say. For girls not to be afraid to raise their hands, they have to know that they will be listened to and that they won't be disrespected.

Students are more apt to be involved in class when they know they will get the teacher's attention. Yet most teacher attention goes to a small number of "target" students, who are generally boys and always assertive.

It doesn't have to be that way. You can broaden the pool of who talks and who listens in class, and make the class a place that is comfortable for both asking questions and giving answers. Strategies to do this include:

## I. Make students feel their response is valued:

- Follow up on student comments as often as you possibly can.
- Give deserved praise or a deserved reprimand every time.
- Watch your expression as well as your words when responding to students. Give a positive verbal as well as non-verbal message.

## II. Check who is getting your attention:

- Use the class list to mark off the names as you ask students questions, and make sure everyone gets a turn.
- Try to call on every student at least once a period. (Some teachers actually do this — most call on some students only once or twice a week.)
- Have students work together so you can "get to each group." You may have several short interactions with each group each period. Or, you may have longer interactions with each group over several lab periods, starting each lab period with a group with whom you didn't "get to" the last period.

### III. Talk to students during out-of-class time:

- Pick one or two students from the class list each day and build some out-of-class personal time with them to chat and break down some barriers. It helps them to speak up in class.
- Speak individually, outside of class, to students who don't talk in class, to see if everything is okay. Encourage them to talk in class and to come in for extra help if they need it. Try again also with students whose grades drop.

### IV. Get the very talkative student to quiet down:

- Outside of class, speak to the student about the need to let others speak. If necessary, set up signals between the two of you to let the student know when to "cool it." The signal may be a code word or a hand signal but it should only be between the two of you — the rest of the class shouldn't know about it.
- If at times you give the student the attention he or she needs, that often "cools them out." Otherwise try to be honest about why you can't give them the attention.

### V. Keep control when there is a lot of student interaction:

- Have the students figure out a signal for "quiet" for you to use.
- If you can't get a good mix of student responses with calling out, insist on hands raised and explain why.
- Use behavior modification techniques to train students to build on each other's answers rather than speaking all at once.



# Motivation, Fun and Hard Work: Increasing Academic Success

The following are some teacher techniques to increase the fun, motivation and academic success of students, particularly female students, in math and science.

## I. Include some fun.

- Schedule something fun and unusual as a reward for making it through the exam, the advanced placement, or even a hard topic. Rewards can range from pizza parties, a viewing of the movie "Stand and Deliver," to a costume day or even a Square One TV marathon.
- Have students make up and use games, like "Chemistry Jeopardy," with prizes for the winning team (like no homework for a night) to motivate rote learning. Having a team, as a whole, answer questions builds team feelings and doesn't put individuals on the spot.
- When possible, add "silly examples" like using a stuffed Kermit the Frog and a record on a turntable to illustrate centrifical and other forces.

## II. Use multiple modes of instruction.

- Where possible, use graphics, words and illustrations to present concepts so if a student doesn't get it one way, they may another.
- Encourage the development of study groups so students can learn from each other.
- Do as much hands-on as possible, with every student getting a chance to do it.
- Watch student faces. Note body language and facial expressions as well as questions to determine who has gotten it and who hasn't yet.
- Along with in-class question time, provide some out-of-class question time as well. Anonymous comments on 3X5 index cards work well too.
- Try having students read the book and do some problems **before** you go over the material in class.

## III. Respect the students' knowledge.

- Praise students for finding alternative ways to solve problems. Make it a challenge for them to do problems several different ways.
- Reward students for finding and pointing out your mistakes. It keeps them paying attention.
- With the students, explore where "wrong" answers are coming from and see the understandings and misunderstandings that are behind them.

#### IV. Assume students have a math and science future.

- Always have an answer to, "Why do we have to learn this?" other than, "It will be on the test." For example, "You don't need to know this for the AP but in your math and science future, 25 years from now if you don't know it, you may get fired," is one possible answer.
- Use posters, guest lectures and stories to bring math and science careers to students. Ethnically diverse female and male role models can make a difference.
- Provide students with information about the many math and science summer programs that are available to both gifted and "regular" students.

IV. Remember that even students whom you (and they) think don't need support, will at some point need it. Keep the support coming to everyone.



So ask yourself:

"Is this a classroom in which I would have fun learning in?"

If the answer is no, you need to make some changes.

# Next Steps

For more information on student math and science programs, contact your local university or:

Math Science Network  
Mills College  
Oakland, CA 94613  
(510) 430-2222

National Coalition for Minorities in Engineering (NACME)  
3 West 35th Street  
New York, NY 10001  
(212) 279-2626

Summer Science Camps (for Minority Students)  
Career Access Program  
Directorate for Education and Human Resources  
National Science Foundation  
4201 Wilson Boulevard  
Arlington, VA 22230

Women in Engineering Program Advocates Network (WEPAN)  
c/o Women's Programs  
Stevens Institute of Technology  
Hoboken, NJ 07030  
(201) 216-5245

For more information on ways to encourage girls (and other students):

Bailey, S. et al. (1992). The AAUW Report: How Schools Shortchange Girls. Washington, DC: AAUW Education Foundation.

Kahle, J. (1990). "Why Girls Don't Know," in M. Rowe (Ed.), *What Research Says to the Science Teacher: The Process of Knowing*. Vol. 6. Washington, DC: National Science Teachers Association. pp. 55-67.

"Spark Girls' Interest in Science with These Resources." (October/November 1994). National Science Teachers' Association (NSTA) Reports.

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This brochure is one of a series on equity in coed classes. Other brochures are:  
Girls Are...Boys Are...: Myths, Stereotypes & Gender Differences  
Whose Responsibility Is It? Making Coeducation Work in Math & Science: The Administrator's Role  
Why Me? Why My Classroom? The Need for Equity in Coed Math and Science Classes

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