

Increasing Access to STEM

Office of Civil Rights statement on STEM:

Discrimination on the basis of race, color, national origin, sex, or disability is prohibited in all of a school's educational programs and activities, including STEM courses and programs. Schools must ensure that their STEM courses and programs are free from these forms of discrimination.

STEM classes are critical to preparing students for college and careers in the 21st century. Ensuring access to STEM for all students is an important priority for the Office for Civil Rights. The Office for Civil Rights continuously strives to provide guidance and support to schools and colleges to bolster access to STEM courses and programs for all students.

STEM teachers need to:

- Develop and/or improve knowledge of language acquisition
- Know and apply Sheltered Instruction strategies
- Broaden understandings of family engagement
- Draw upon students' funds of knowledge
- Broaden forms of assessment
- Counsel underrepresented groups into rather than away from STEM fields
- Be prepared to offer remedial help as needed, to strengthen students' foundational skills
- Build a network of community role models doing STEM work
- Be open to cultural exchange opportunities for teachers that can increase empathy, understanding, and appreciation
- Critically examine their own teaching materials and paradigms for cultural bias
- Develop and facilitate problem-based learning activities around issues relevant to the community

Impact Data:

- Decreased dropout rates
- Increased completion rates
- Improved standardized test scores
- Higher numbers of AP and honors placements
- Qualitative data from students and families
- Number of early college credits
- Increased college/university enrollment rates



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Encouraging Girls in Math and Science¹

Areas where consistent gender differences have emerged are children's and adolescents' beliefs about their abilities in math and science, their interest in math and science, and their perceptions of the importance of math and science for their futures. In general, researchers have found that girls and women have less confidence in their math abilities than males do and that from early adolescence, girls show less interest in math or science careers. This gender difference is interesting, and somewhat puzzling, given that males and females generally enroll in similar courses and display similar abilities (at least as measured by course grades).

In other words, girls, particularly as they move out of elementary school and into middle and high school and beyond, often underestimate their abilities in mathematics and science. However, it is important to note that not all girls have less confidence and interest in mathematics and science, and that girls, as well as boys, who have a strong self-concept regarding their abilities in math or science are more likely to choose and perform well in elective math and science courses and to select math- and science-related college majors and careers. This is noteworthy because it suggests that improving girls' beliefs about their abilities could alter their choices and performance. Theory and empirical research suggest that children's beliefs about their abilities are central to determining their interest and performance in different subjects, the classes they choose to take, the after-school activities they pursue, and, ultimately, the career choices they make.

What can teachers do to encourage girls to choose career paths in math- and science-related fields? One major way to encourage girls to choose careers in math and science is to foster the development of strong beliefs about their abilities in these subjects—beliefs that more accurately reflect their abilities – and more accurate beliefs about the participation of women in math- and science-related careers. Our first two recommendations, therefore, focus on strategies that teachers can use to strengthen girls' beliefs regarding their abilities in math and science: (1) Teach students that academic abilities are expandable and improvable; and (2) Provide prescriptive, informational feedback. Our third recommendation addresses girls' beliefs about both their own abilities and the participation of women in math- and science-related careers: (3) Expose girls to female role models who have succeeded in math and science.

¹ IES Practice Guide. National Center for Education Research, Institute of Education Sciences. (2007). http://ies.ed.gov/ncee/wwc/pdf/practice_guides/20072003.pdf