

Designing Gender-Inclusive STEM Classes

Some girls never consider STEM as a potential career. Here are some ways to make your STEM class more gender-inclusive.

Use Inclusive Language¹⁻³

Using gendered language or defaulting to “he” when referring to an unknown person can make girls and non-binary students feel excluded.

Okay, ~~guys~~ -

Instead, try:

- students
- team
- friends
- folks
- everyone
- y'all

Neutral pronouns:

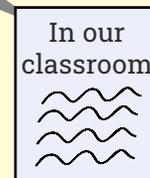
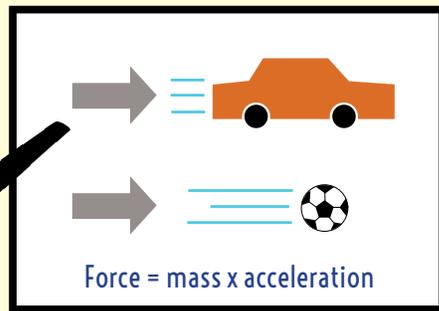
- they/them
- one

Use Specific Guidelines for Bullying & Harassment^{4,5}

Develop community policies & guidelines together. Agree on consequences for violations & share with everyone. Bullying can impact students' mental health.

Include Women's Stories & Histories in Curriculum^{6,7}

Kids still associate science more with men than women.⁷ Ensure teaching & coursework include & integrate examples of women & girls, beyond one-offs like International Women's Day. Women of colour are particularly underrepresented.



Include gender-inclusive imagery, media & decorations in your classroom!^{6,8,9}

Expand Your Definition of Science^{7,9-13}

Science is stereotyped as nerdy & disconnected from the real world. Girls choose not to pursue science because they do not see it connected to the goals they care about.^{10,13} Use activities & assignments that demonstrate how science & math are integral to everyday life.

For example:

Baking & cooking are chemistry

Clean water is water infrastructure

Ask students to talk to their family about how they use science in their lives

De-emphasize Innate STEM Abilities^{1,14,15}

STEM is not “effortless” for all students. Praise everyone for hard work & effort; emphasize mastery goals (building skills) over performance (performing well). Children are more likely to label boys as “really, really smart” than girls.¹⁴

Expand Academic Evaluation Methods^{16,17}

Multiple choice tends to favor boys' performance. Make sure your coursework includes open-ended assignments that allow girls to demonstrate understanding.

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Small changes can make a difference over the long term. Learn more about gender-based stereotypes and implicit bias, what you can do to combat it, and our research in our white paper series on our website.



References

1. Stout, J.G., & Dasgupta, N. (2013). Mastering one's destiny: Mastery goals promote challenge and success despite social identity threat. *Personality and Social Psychology Bulletin*, 39(6), 748-762. doi:10.1177/0146167213481067
2. Schau, C. G., & Scott, K. P. (1984). Impact of gender characteristics of instructional materials: An integration of the research literature. *Journal of Educational Psychology*, 76(2), 183-193. doi:10.1037/0022-0663.76.2.183
3. Sczesny, S., Formanowicz, M., & Moser, F. (2016). Can gender-fair language reduce gender stereotyping and discrimination? *Frontiers in Psychology*, 7, 25. doi:10.3389/fpsyg.2016.00025
4. Harding, J. (1985). The making of a scientist? *Higher Education Quarterly*, 40(1), 55-62. doi:10.1111/j.1468-2273.1985.tb01450.x
5. Jorg, T., & Wubbels, T. (1987). Physics is a problem for girls, or girls a problem for physics? *International Journal of Science Education*, 9(3), 297-307. doi:10.1080/0950069870090306
6. Good, J.J., Woodzicka, J.A., & Wingfield, L.C. (2010). The effect of gender stereotypic and counter-stereotypic textbook images on science performance. *Journal of Social Psychology*, 150(2), 132-147. doi: 10.1080/00224540903366552.
7. Miller, D.I., Nolla, K.M., Eagly, A.H., & Uttal, D.H. (2018). The development of children's gender-science stereotypes: A meta-analysis of 5 decades of U.S. draw-a-scientist studies. *Child Development*, 89(6), 1943-1955. doi: 10.1111/cdev.13039
8. Cheryan, S., Plaut, V.C., Handron, C., & Hudson, L. (2013). The stereotypical computer scientist: Gendered media representations as a barrier to inclusion for women. *Sex Roles*, 69, 58-71. doi:10.1007/s11199-013-0296-x
9. Hoofd, I.M. (2014). Gender in science and technology. Interdisciplinary approaches. *Critical Policy Studies*, 8(4), 496-498. doi:10.1080/19460171.2014.957046
10. Diekman, A.B., Weisgram, E.S., & Belanger, A.L. (2015). New routes to recruiting and retaining women in STEM: Policy implications of a communal goal congruity perspective. *Social Issues and Policy Review*, 9(1), 52-88. doi:10.1111/sipr.12010
11. Harackiewicz, J.M., Rozek, C.S., Hulleman, C.S., & Hyde, J.S. (2012). Helping parents to motivate adolescents in mathematics and science: An experimental test of a utility-value intervention. *Psychological Science*, 28(8), 899-906. doi:10.1177/0956797611435530
12. National Academy of Engineering. (2008). Changing the conversation: Messages for improving public understanding of engineering. Washington, DC: The National Academies Press. doi:10.17226/12187.
13. Weisgram, E.S., & Diekman, A.B., (2017). Making STEM "family friendly": The impact of perceiving science careers as family-compatible. *Social Sciences*, 6(2), 61. doi:10.3390/socsci6020061
14. Bian, L., Leslie, S.-J., & Cimpian, A. (2017). Gender stereotypes about intellectual ability emerge early and influence children's interests. *Science*, 355(6323), 389-391. doi: 10.1126/science.aah6524
15. Bagès, C., & Martinot, D. (2015). Virtues of hardworking role model to improve girls' mathematics performance. *Psychology of Women Quarterly* 40(1), 56-64. doi:10.1177/0361684315608842
16. Reardon, S.F., Kalogrides, D., Fahle, E.M., Podolsky, A., & Zarate, R.C. (2018). The relationship between test item format and gender achievement gaps on math and ELA tests in fourth and eighth grades. *Educational Researcher*, 47(5), 284-294. doi:10.3102/0013189X18762105
17. Taylor, J. (2019). Fairness to gifted girls: Admissions to New York City's elite public high schools. *Journal of Women and Minorities in Science and Engineering*, 35(1), 75-91. doi:10.1615/JWomenMinorScienEng.2019026894

About Project PRISM

How can we make STEM a more attractive and meaningful option for adolescent girls and boys alike? Project PRISM (Promoting Rising Inclusion and STEM Motivation) will establish best practices for boosting girls' belonging in STEM, while bolstering boys' respect for girls' abilities. To combat obstacles girls may face in pursuing a STEM career, Project PRISM will test interventions that: (1) change boys' beliefs about girls via implicit bias training and presenting real evidence that test scores underestimate girls' abilities, (2) expose girls to successful role models who share their values and preferences, and (3) encourage girls to identify with STEM by recognizing that a STEM career can help them accomplish some of their most cherished goals.

About Engendering Success in STEM (ESS)

Engendering Success in STEM (ESS) is a research partnership focused on evidence-based solutions to foster positive working environments for people in STEM (Science, Technology, Engineering, and Math). We bring together social scientists, STEM experts, and stakeholders in STEM industry and education to use an evidence-based approach to break down barriers people face on their pathway to success. Canada's Social Sciences and Humanities Research Council reviewed and funded this project.

Resources

Bring Women Experts To Your Classroom:

- [Request a Woman Scientist: 500womenscientists.org/request-a-scientist](https://500womenscientists.org/request-a-scientist)
- [Skype a Scientist: skypeascientist.com](https://skypeascientist.com)

Free Female STEM Role Model Posters

- [Women You Should Know: downloadable-stem-role-models-posters](https://womenyoushouldknow.net/downloadable-stem-role-models-posters)
- [Beyond Curie: beyondcurie.com/march-for-science-posters](https://beyondcurie.com/march-for-science-posters)
- [US Department of Energy: energy.gov/downloads/women-stem-posters-series-one](https://energy.gov/downloads/women-stem-posters-series-one)