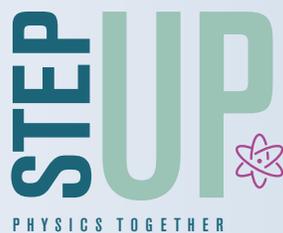


Women in Physics

LESSON PLAN



This material is based upon work supported by the National Science Foundation under Grant Nos. 1720810, 1720869, 1720917, and 1721021. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.



QUICK REFERENCE GUIDE

Help students **examine the conditions for women in physics** and **discuss gender issues** with respect to famous physicists, gendered professions, and personal experience to **neutralize the effect of stereotypes and bias**. Students participate in an interactive presentation by the teacher, in which data about women in physics around the world are discussed. The role of culture and society are considered.

1. Students perform an Internet search for physicists to identify trends in stereotypes about those who work in physics.



2. Students read biographies of historical physicists as well as one modern physicist and complete a reflection worksheet.



3. Students participate in an interactive presentation by the teacher, in which data about women in physics around the world are discussed. The role of culture and society are considered.



4. Students discuss the outcomes of their Internet search and biographical analyses, and synthesize conclusions from the whole class discussion.



5. Students voluntarily contribute their own experiences with gender bias to a class discussion, and consider how this might influence their own views about gendered careers and a future in physics.



6. Students respond to a prompt about their own experience with gender bias.



Learn more at STEPUPphysics.org and register to access instructional support & FAQs

WOMEN IN PHYSICS SUPPORTING RESEARCH

Lesson Topic: In this lesson, students will examine the conditions for women in physics drawing on current statistics/research and their experiences with physics. The goal of the lesson is to help students reflect and think critically about the issue in order to neutralize the effect of bias, particularly for female students.

Lesson Evidence: This lesson has been shown to improve students' future physics intentions (e.g. majoring in physics in college, intending physics-related careers) in classes across the US (N=823). Figure 1 shows that both female and non-female students have positive gains from the lesson. In addition, the overall gains from the lesson across all students are positive (Cheng et al., 2018).

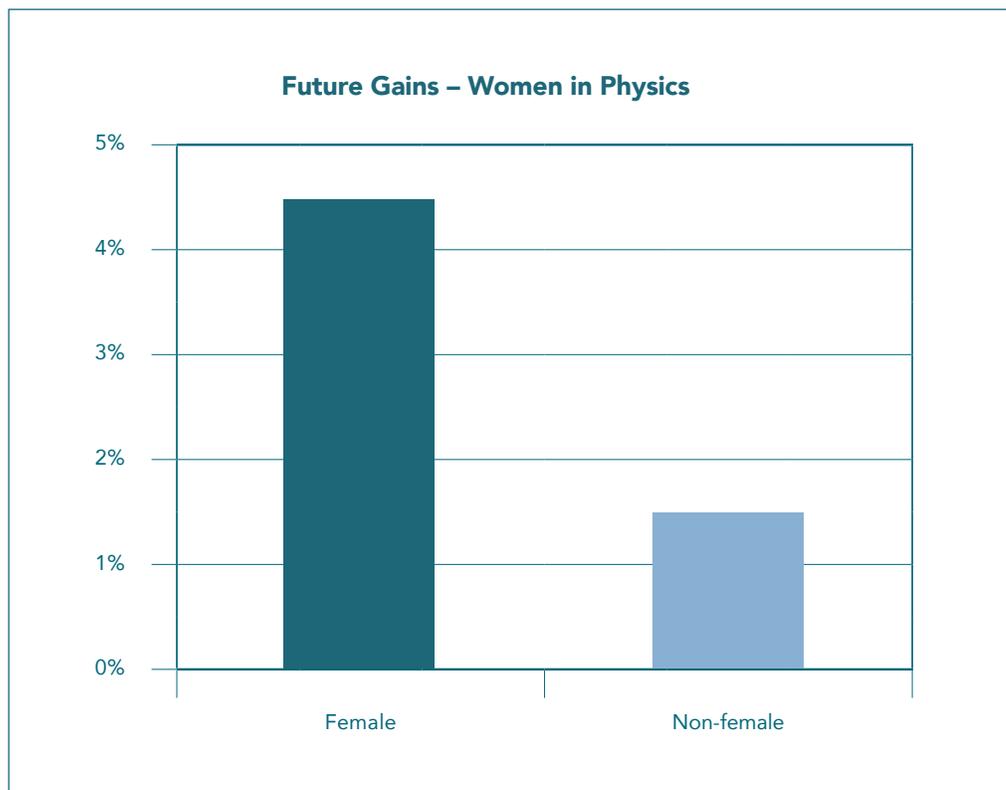


Figure 1. Percentage gains in female and non-female students' future physics intentions (towards majoring/pursuing a career) due to the lesson.

Teacher Motivations: Quotes about why physics teachers did the lesson.

- "We are the only way that these women are going to realize the opportunities that are available to them."
- "It shows the women in the class that it is important to you, the teacher, if you discuss these issues. That they are important to you."
- "It challenges misconceptions about what helps women."
- "I was nervous about it but then I realized how much students got out of it."

Explaining It to Students: Quotes about how physics teachers justified it to students.

- "As a white guy, these may not be things I have experienced but that doesn't mean that these things aren't important to talk about."
- "I want to hear what you, the students, think about these issues."
- "It is important to not exclude others from opportunities."
- "It is important to understand what society thinks about physics and whether these beliefs are valid."

Implementation Timing: Physics teachers suggested the optimal timing for implementation is (i) after a classroom community is established and (ii) around a time when a topic of interest to women is being covered (e.g. astronomy, light/waves, biophysics applications, alternative energy) (iii) before college applications are due (for any seniors), if possible.