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# WHAT “DRAW-A-SCIENTIST” REVEALS ABOUT GENDER STEREOTYPES

In 1983, a social scientist named David Chambers published a research study on children’s drawings. The study summarized data from the late 1960s and 1970s in which teachers asked 5,000 children to “draw a scientist.” One theme appeared strongly: the scientist drawings were almost all men. Recently, researchers looked at 78 “draw-a-scientist” studies (from 1985 to 2016) involving 20,000 children. In this study, 28% (about 3 in 10) students drew women as scientists. Younger children, girls in particular, were the most likely to sketch women scientists. Although the percentage of students depicting scientists as men has declined since the initial study, the majority of students still draw males, indicating that gender stereotypes are still present.

This lesson provides an opportunity for elementary students to explore gender norms and stereotypes by reflecting on their own scientist drawings, learning more about the history of these studies and writing characters that challenge gender norms.

See these additional ADL resources: Lesson plans “[Mo’Ne Davis and Gender Stereotypes](#),” “[Toys and Gender](#),” “[Moving Beyond Gender Barriers in our Lives](#),” [7 Ideas for Teaching Women’s History Month](#)” and “[Diverse Books Matter](#)” and Early Childhood FAQs “[How Can I Prevent Gender Bias in Young Children?](#)”

**Grade Level:** grades 2–5

**Time:** 45–60 minutes

**Common Core Anchor Standards:** Reading, Writing, Speaking and Listening

**Learning Objectives:**

- Students will draw a scientist and then reflect on the extent to which they see patterns among their classmates’ drawings.
- Students will learn about the history of the Draw-a –Scientist Test (DAST) and consider its implications about gender and stereotypes.
- Students will write a story and character that dispels gender norms and stereotypes.

**Materials:**

- White drawing paper (one for each student)
- Drawing supplies such as colored pencils, crayons and magic markers
- “More Children See Scientists as Women” (Newsela, April 6, 2018, <https://newsela.com/read/more-children-see-scientists-as-women/id/41599/>, one copy for each student)

**Compelling Question: Why do more children draw scientists as male?****Vocabulary:**

Review the following vocabulary words and make sure students know their meanings. (See ADL's "[Glossary of Education Terms](#)" and [Definitions Related to Bias, Injustice and Bullying for Elementary Students](#).)

- cultural
- expert
- image
- predicted
- tech-savvy
- discovery
- exposed
- likely
- promising
- trend
- doodles
- gender
- media
- represented
- equal
- groundbreaking
- percentage
- stereotypes

**DRAW A SCIENTIST**

1. Ask students: *What is a scientist?* Explain that a **scientist** is someone who studies or investigates nature and the laws of nature and does scientific work.
2. Distribute paper and drawing supplies. Instruct students to draw a picture of a scientist at work. Don't give any more instructions than that. Give students 15 minutes to complete their drawings.
3. After students have finished their drawings, have them share their pictures with the people at their tables or have them talk in small groups of 3–4. Instruct them to explain briefly what's going on in their picture. Then, display (on walls or desks) the pictures around the room and allow students to do a gallery walk so they can see all the pictures.
4. Engage students in a discussion by asking the following questions:
  - What first came into your mind when I asked you to draw a scientist?
  - How did you come up with an idea for your drawing?
  - As you walked around the room looking at everyone's picture, what did you notice?
  - What were the similarities among the pictures?
  - What differences did you notice?

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**NOTE:** If there are clear patterns among the pictures such as mostly male, older, White or some other aspect of identity, point those patterns out if the students do not.

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- Why do you think those similarities exist among our pictures?
- What did you learn by doing this?

**INFORMATION SHARING**

1. Give students some background information about the Draw-a-Scientist Test research by sharing some or all of the following information, adjusting your language/terminology as needed. Explain that they will learn more throughout the lesson.
  - In 1983, a social scientist named David Chambers published a research study on children's drawings. The study gathered information from the late 1960s and 1970s in which teachers asked about 5,000 children (in three different countries) to "draw a scientist." One theme appeared

strongly: the scientist drawings were almost all men. Through the study, Chambers was able to show that children begin to develop assumptions and generalizations about scientists from a very early age.

- Of the 5,000 students in the survey—which included about half boys and half girls—only 28 students total drew female scientists. This represents less than 1% of all the students in the study. [For younger students or visual learners, it may be helpful to create a visual of 1% by showing 99 objects of one color and one object of a different color, or create a pie graph.]
  - Recently, researchers looked at 78 “draw-a-scientist” studies (from 1985-2016) that included 20,000 children in total. Of these, 28% (about 3 in 10) of students drew women as scientists. Younger children, girls in particular, were the most likely to sketch female scientists. [Again, for younger students, use a visual representation of 3 in 10.]
  - This means that over the past 35+ years, the way children have drawn scientists has changed a lot. In the 1960s and 1970s, very few children drew scientists as women but starting in 1985 up until recently, 3 in 10 children drew women scientists.
  - The researchers also found a change in children at around age 8. Before that age, most girls drew women scientists and most boys drew men scientists. But as students grew older, they all began to draw more men than women.
2. Engage students in a brief discussion by asking the following questions:
- What do you think about this?
  - What surprises you?
  - Why do you think the results of the study changed over time?

## READING ACTIVITY

1. Distribute a copy of the Newsela article, “[More Children See Scientists as Women.](#)” Give students ten minutes to silently read the article or read the article aloud by having students take turns reading.

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**NOTE:** This article is from [Newsela](#), a website that publishes high-interest news articles daily at different reading levels from grades 2–12. The article above is a 5th grade reading level. If your students are younger, you can either use the 3<sup>rd</sup> grade reading level or read this aloud. This particular content is available at the 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> grade levels. You have to register (free) to access the articles.

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2. Engage students in a discussion by asking some or all of the following questions:
- What did you learn that you didn’t know before?
  - What changed in children’s drawings from the 1960s/1970s to today?
  - Why do you think there has been this change?
  - How do the researchers explain the difference between then and now?
  - In the recent study, what are some of the differences between young children and older children?
  - What factors in society help explain whether children draw male or female scientists?
  - What do you think we can do about the fact that more children still draw male scientists?

3. If available, you may also want to read and discuss related children's books such as [Ada Twist, Scientist](#), [Rosie Revere Engineer](#) (includes a teaching guide from ADL) and other books about [gender norms](#).

### WHAT ARE STEREOTYPES?

1. Ask students: *Does anyone know what a stereotype is?* Elicit/explain that a **stereotype** is the false idea that all members of a group are the same and think and behave in the same way.
2. Ask students to provide an example of a stereotype from the article they read. Then, explain that the study reveals stereotypes about gender and science—that men are usually scientists and women are usually not. This could also show that people hold stereotypes that girls and women are not as good at or as interested in science as boys and men are.
3. Ask students if they can think of another stereotype about gender and allow them to briefly share. State the following example: "Girls aren't good at sports." Ask: *Is this statement true? Is it true for some girls but not all girls? Is the opposite true for boys (that they are all good at sports)? Do you know girls who are good at sports? Do you know any boys who aren't good at sports?* Explain to students they just need to answer these questions "yes" or "no" and not name specific people.

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**NOTE:** Some students may feel reluctant to express stereotypes for fear that others will think they believe those stereotypes. Emphasize that the words and ideas students share do not necessarily reflect their actual beliefs but they emphasize how deeply ingrained stereotypical thinking is in all of us. Assure students that they should share without fear of judgment.

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4. On the board/smart board, write "boys" and "girls" in separate circles. Ask students to call out their connections and associations with "boys" (words, colors, games, activities, etc.) and then do the same with the word "girls."
5. Engage the students in a class discussion by asking the following questions:
  - How do these words make you feel?
  - Are the stereotypes true for all girls or all boys?
  - Is this fair? Is this right?
  - How do stereotypes hurt boys and girls? How do they impact our community and society?
  - Are these stereotypes?
  - Where do stereotypes come from?
6. As students respond to the last question about where stereotypes come from, generate a list of ideas on the board/smart board, eliciting further suggestions from the students. The list might include: products such as toys, colors, bed sheeting, school supplies, clothes, backpacks; media such as ads, video games, TV shows, movies, websites; people like friends, family members, teachers, other adults; books and magazines and personal experiences.
7. Explain that stereotypes can be hurtful because sometimes people believe the stereotypes about themselves (as in girls and science) and this causes them not to explore things they may be interested in and pass up certain opportunities. Ask: *Can anyone think of an example of how this has happened?* (Share an example from your own or someone else's life.) Also, explain that stereotypes are harmful because they can lead to prejudice and discrimination. Define these terms as follows:

**Prejudice:** Judging or having an idea about someone or a group of people before you actually know them. Prejudice is often directed toward people in a certain identity group (race, religion, gender, etc.).

**Discrimination:** Unfair treatment of one person or group of people because of the person or group's identity (e.g. race, gender, ability, religion, culture, etc.). Discrimination is an action that can come from prejudice.

### WRITING ACTIVITY

If time permits, have students write a story about a character and plot line that challenges or dispels a gender norm and/or stereotype. Have students engage in a writing process that includes the following steps: pre-write, draft, conference with each other, revise and edit in order to create a final product.

### CLOSING

Have students read a sentence or two of their stories (or the beginning of their stories) aloud.

### ADDITIONAL READING AND RESOURCES

- [“Only 3 in 10 children asked to draw a scientist drew a woman. But that’s more than ever.”](#) (*The Washington Post*, March 20, 2018)
- [“Quick, Draw a Scientist!”](#) (Edutopia, February 18, 2015)
- [Stereotypic Images of the Scientist: The Draw-a-Scientist Test](#) (*Science Education*, 1983)
- [U.S. children are drawing female scientists now more than ever](#) (Northwestern Now, March 21, 2018)
- [Why So Few? Women in Science, Technology, Engineering, and Mathematics](#) (American Association of University Women)

## COMMON CORE ANCHOR STANDARDS

Content Area/Standard
Reading
Standard 1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
Writing
Standard 3: Write narratives to develop real or imagine experiences or events using effective technique, well-chosen details and well-structured event sequences.
Standard 5: Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.
Speaking and Listening
Standard 1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.