

NOT THE SCIENCE TYPE



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3M AND GENEROUS FILMS PRESENT "NOT THE SCIENCE TYPE" DIRECTED BY JULIO PALACIO PRODUCED BY CHRISTINE ARENA EXECUTIVE PRODUCER ROBERT BRITAIN
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Not the Science Type: *Gitanjali Rao*

Discussion Guide

Goal: Help students consider why stereotypes of scientists and engineers exist and why diversity is a necessity for innovation.

Meet Gitanjali (Gi-tan-ja-lee) Rao, a 16-year-old who loves piano, classical Indian dance, flying gliders and using science and engineering to solve problems. Gitanjali has been interested in science from a young age and combines her passion for science with her love for helping others. For example, after learning of the water crisis in Flint, Michigan, she engineered an inexpensive device to test the lead content of water.

Gitanjali won the Discovery Education 3M's Young Scientist Challenge in 2017, was named TIME's Kid of the Year in 2020 and in 2021 she was named a Laureate of the Young Activists Summit at the United Nations. Gitanjali is passionate about showing girls her age what a scientist can look like!



“Not the Science Type” is a [docuseries](#) featuring four female scientists as they rise to prominence in fields ranging from biology to engineering, to science and technology-based applications and innovations, challenging stereotypes and confronting gender, racial, and age discrimination along the way. While each has taken a different path to pursuing scientific excellence, they are bound by the common experience of feeling outcast or “not the type” in traditionally homogenous scientific fields.

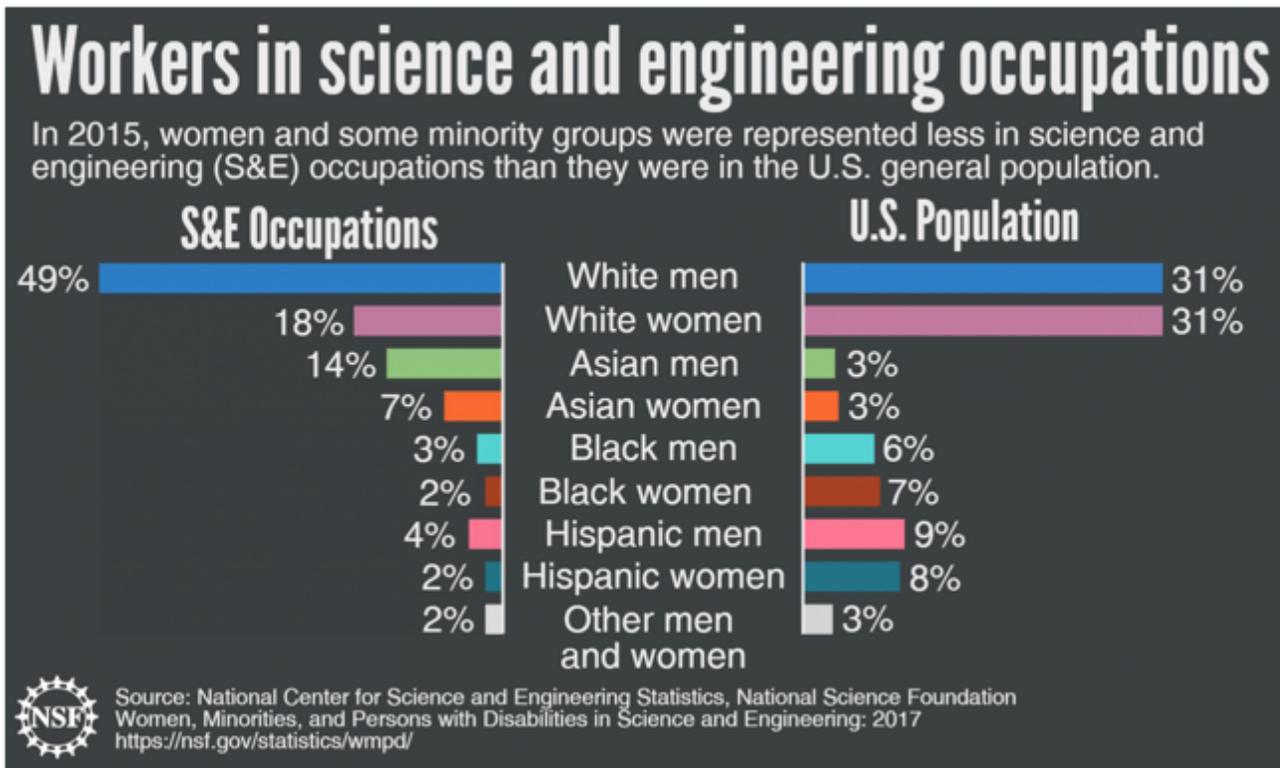
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Before the Video

Engage students in a discussion of beliefs and stereotypes of what a scientist or engineer looks like. Options include:

- Asking students to list as many scientists or engineers as they can in two minutes, then leading the class in an analysis:
 - What trends do students notice?
 - How many are women? Men?
 - Is a particular race or ethnicity dominant?
 - Are any different abilities or neurodivergent thinkers apparent?
 - What might be some of the causes of these trends?
 - How does this list differ from a student-generated list of favorite musical artists or TikTokkers?
- Lead students in a similar analysis as above, but after Image Searching on Google for “famous scientist” or “famous engineer.”
- Asking students to discuss what scientists and engineers look like on a popular TV show, for example, *The Big Bang Theory*. Then leading a discussion around how realistic these portrayals may be.
- Asking students what conclusions they draw from this pair of histograms:



During the Video

- Stop at key points to allow students to reflect on being marginalized.
- **Pause** at 5:57 after Gitanjali says, “I was tired of being pushed over to the side, just because of the way I looked.”
- **Think. Pair. Share.** Have you ever been pushed over to the side, because of the way you look? Why do you think this happened?
- **Think. Pair. Share.** How did you respond? How can you help make sure this does not happen to others?

After the Video

- Help students to explore the necessity of diversity in STEM.
- **Stop and Jot.** Why is “Innovation [...] not an option, it’s a necessity”?
- **Stop and Jot.** Why is it necessary to have a range of people working in STEM in order to innovate?
- **Lead a class discussion.** If students struggle to articulate the benefits of diversity in STEM, prompt students to consider who is left out in certain areas of innovation. For example, airplanes that are only designed for tall pilots, automatic soap dispensers that only detect light colored skin.

Go Further!

- Learn more about Gitanjali:
 - <https://yourstory.com/herstory/2020/12/facts-gitanjali-rao-time-kid-of-the-year-scientist/amp>
 - <https://www.ted.com/search?q=Gitanjali+Rao>
- Learn more about the Flint water crisis that inspired Gitanjali: Vox: Flint's water crisis, explained in 3 minutes <https://www.youtube.com/watch?v=NUSiLOWkrlw&t=205s>
- Go against the stereotype - Learn more about the power of diversity
 - Why diversity in STEM is important from STEMed Labs <https://www.stemedlabs.org/blog/why-diversity-in-stem-is-important/>
 - Diversity in STEM: What It Is and Why It Matters from Scientific American <https://blogs.scientificamerican.com/voices/diversity-in-stem-what-it-is-and-why-it-matters/>
 - Why creating a diverse workforce matters from UNC <https://uncf.org/the-latest/why-creating-a-diverse-workforce-matters>
 - Why diversity matters in leadership from Forbes <https://www.forbes.com/sites/forbescoachescouncil/2021/06/24/14-important-benefits-of-a-more-diverse-leadership-team/?sh=29f5cf6e1f9b>

Activity

- Complete an engineering challenge in student groups that highlights the benefits of a diverse team:
 - TeachEngineering: Design shin guards - how does the outcome depend on the make-up of the design team?
<https://www.teachengineering.org/makerchallenges/view/uconn-2462-shin-guards-design-engineering-challenge>
 - TeachEngineering: Design a device to measure a heartbeat - how does the effectiveness depend on the patient's skin color? [advanced]
<https://www.teachengineering.org/makerchallenges/view/rice3-2349-heartbeat-microcontroller-led-senor-design-challenge>
- Learn more about building positive science identities in your students
 - STEP UP: Physics Together: <https://engage.aps.org/stepup/home>
- Strategies to cultivate diversity during teamwork
 - UC Berkeley Center for Teaching & Learning:
<https://teaching.berkeley.edu/diversity-can-benefit-teamwork-stem>

Careers

Gitanjali combines her passions for science and helping in engineering. Describe your dream career in a few words ... and get suggestions from the [Nepris Career Explorer!](https://www.nepris.com/app/career-explorer)
<https://www.nepris.com/app/career-explorer>

Meet...

Other engineers and entrepreneurs like Gitanjali at the IF/THEN Collection:

- **Dr. Nicole Sharp:** *aerospace engineer and science communicator*
<https://ifthenexhibit.org/ambassador/A-27/>
- **Gracie Ermi:** *Research software engineer* <https://ifthenexhibit.org/ambassador/A-29/>
- **Yamilée Toussaint Beach:** *Dancer, STEM educator and entrepreneur*
<https://ifthenexhibit.org/ambassador/B-04/>

IF/THEN®, an initiative of Lyda Hill Philanthropies, was founded to increase diversity and representation of women in science, technology, engineering, and math (STEM) by empowering current innovators and inspiring the next generation of pioneers. One hundred twenty-five AAAS IF/THEN® Ambassadors were selected and supported to serve as high-profile role models for middle school girls from 2019 through 2021. They have pursued careers in a wide range of STEM disciplines including neuroscience, immunology, machine learning, mathematics, and many more. Learn more about the unique stories of these women innovators at the [IF/THEN Collection](#).

