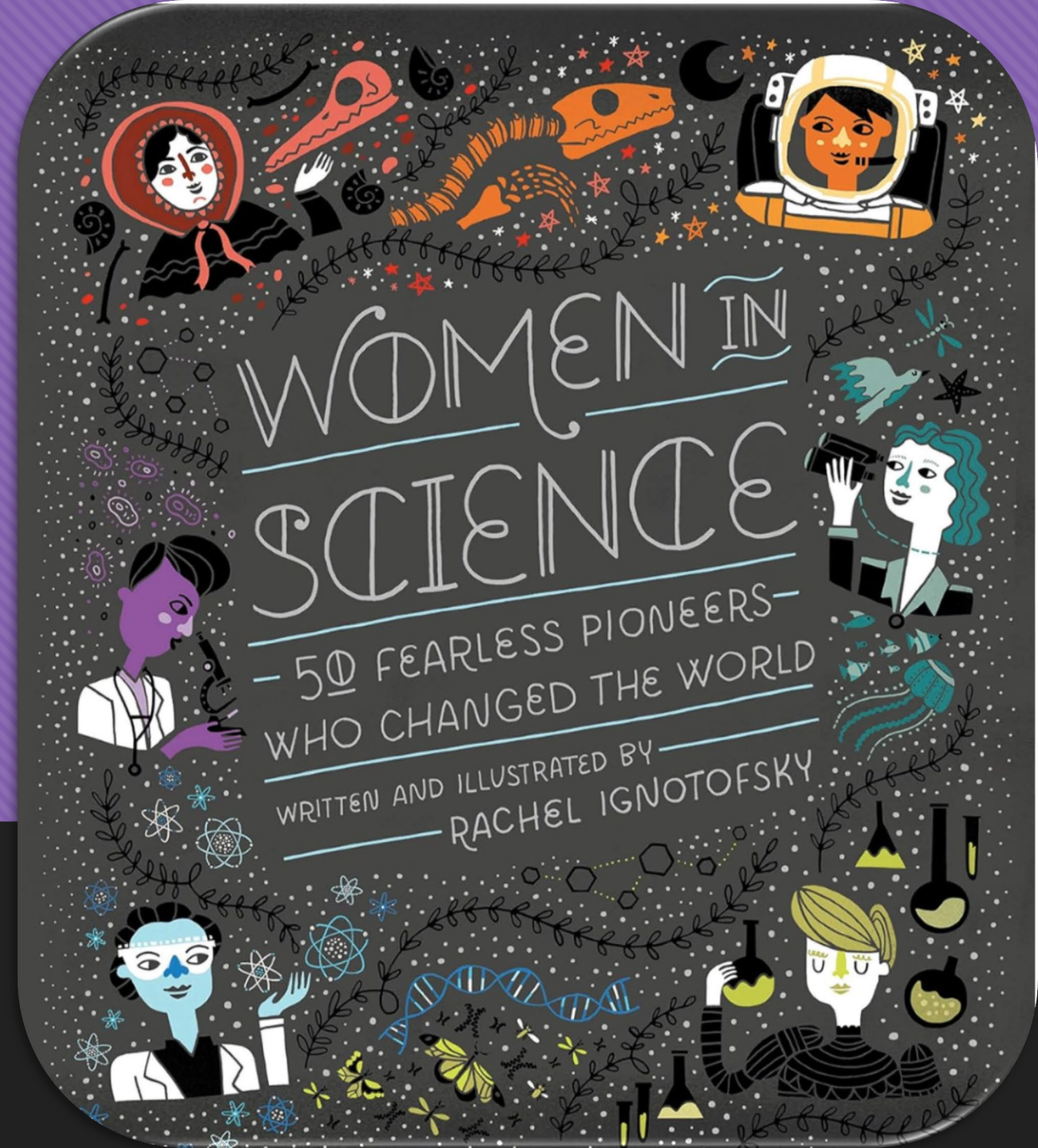


Science on Tap: Women in STEM

Dr. Lisa Sullivan – Department of Chemistry

Dr. Kallina Dunkle – Department of Earth & Environmental Science

Women Trailblazers



Trailblazers in

CoSTEM







Marie Curie



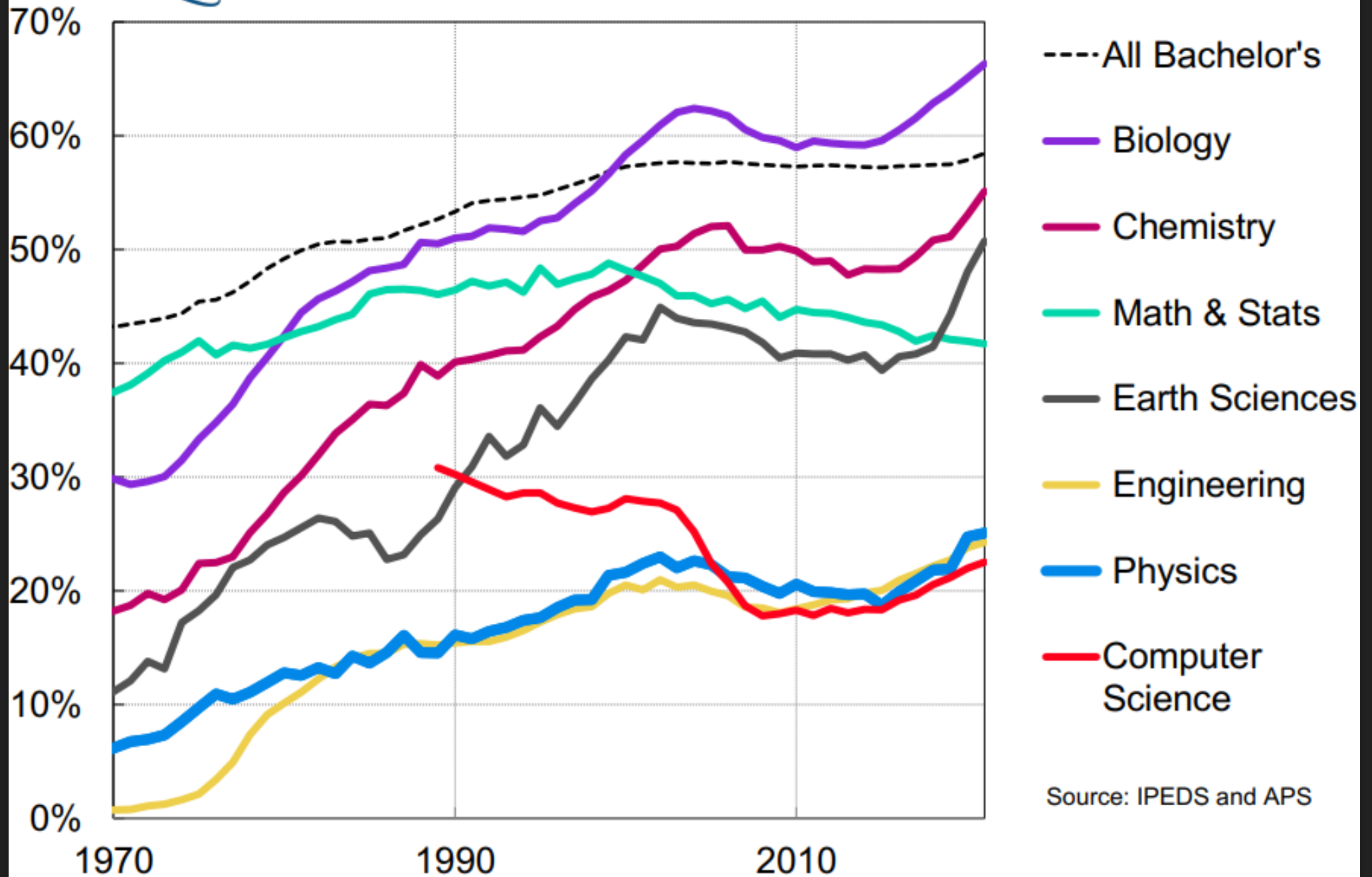
Marie Curie – Photo gallery, NobelPrize.org, Nobel Prize Outreach AB 2024. Mon. 1 Apr 2024.
<<https://www.nobelprize.org/prizes/physics/1903/marie-curie/photo-gallery/>>

Mary Anning





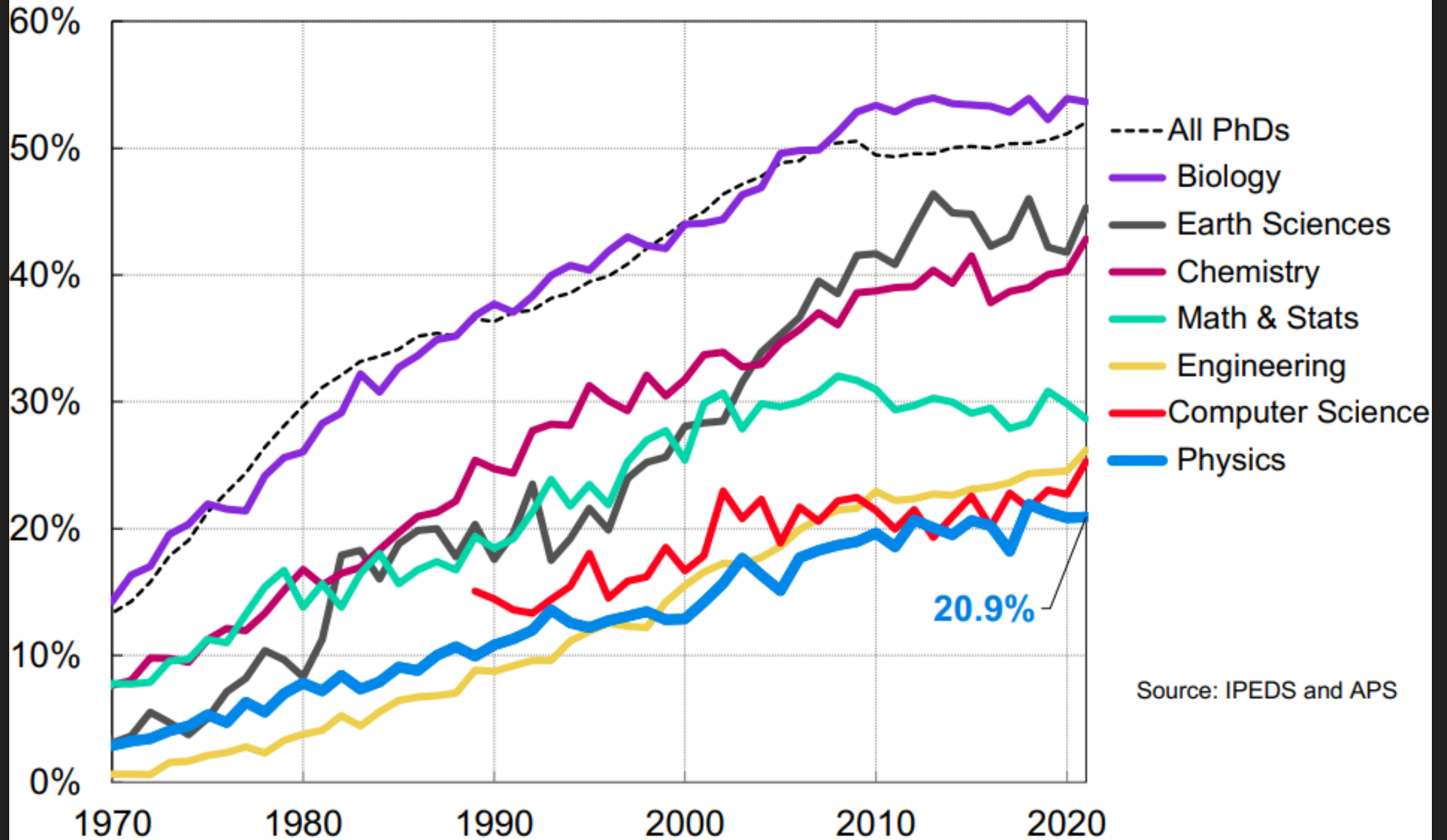
Bachelor's Degrees Earned by Women



Source: IPEDS and APS

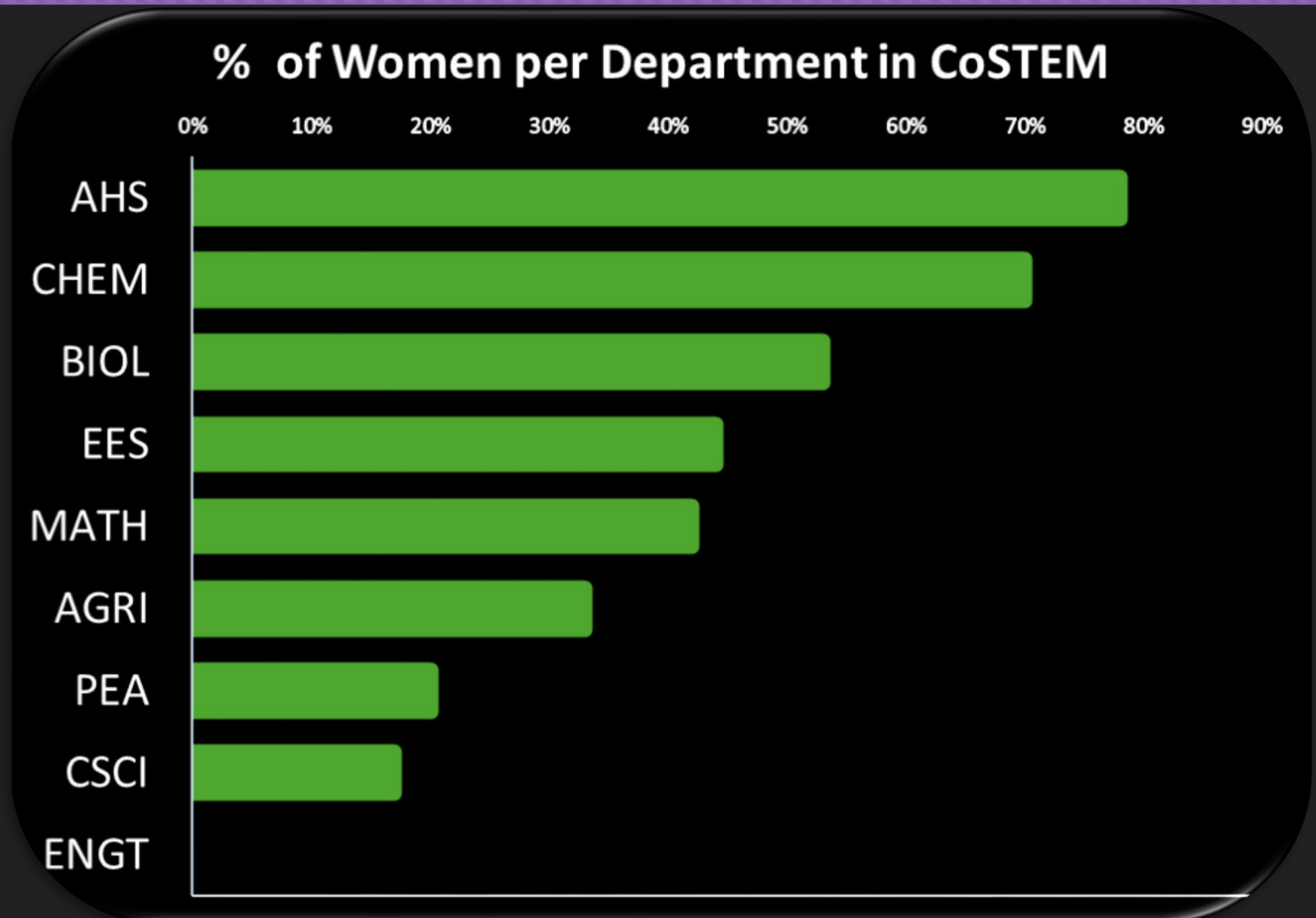
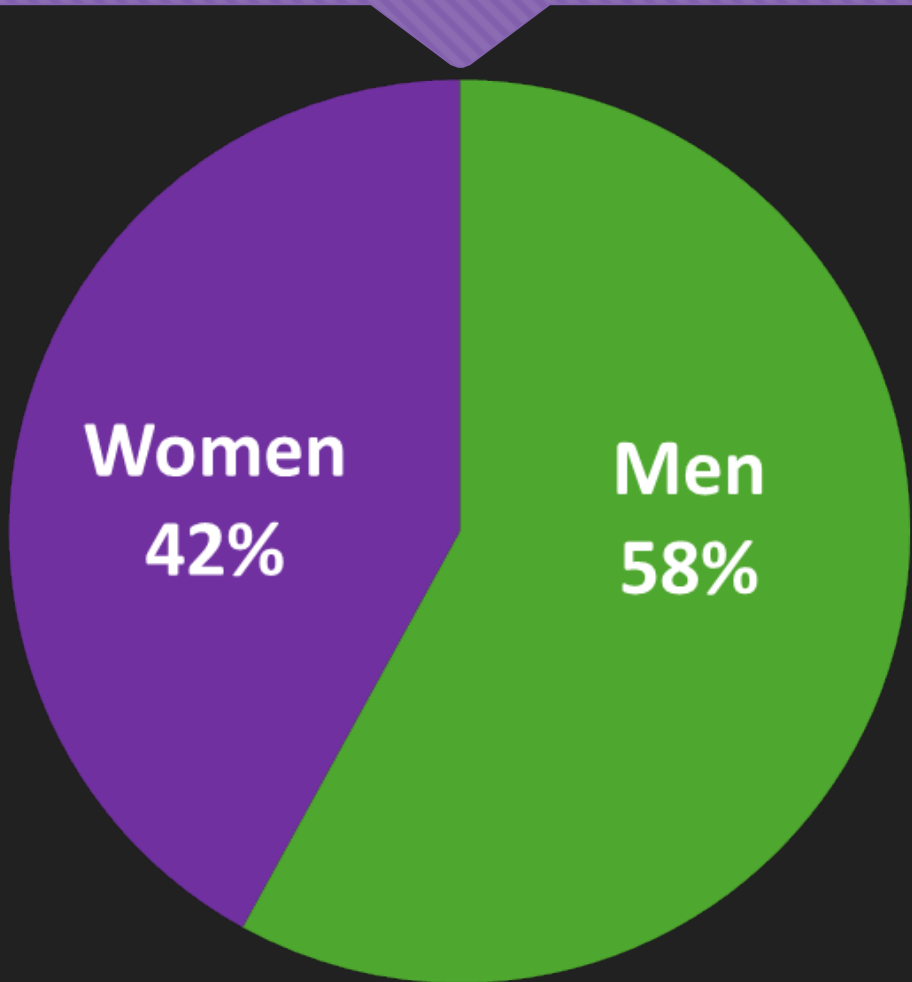


Doctoral Degrees Earned by Women



Source: IPEDS and APS

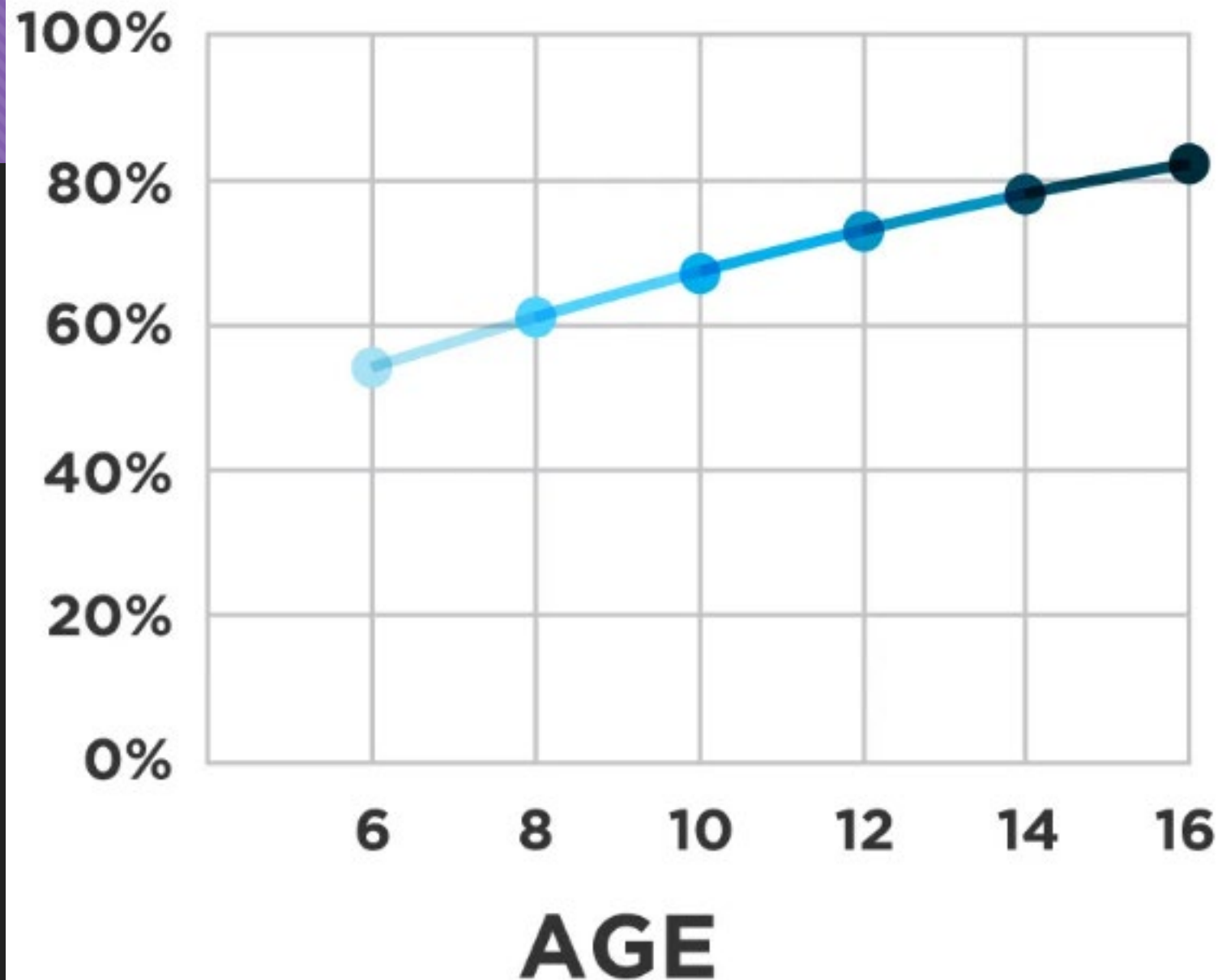
Representation in CoSTEM

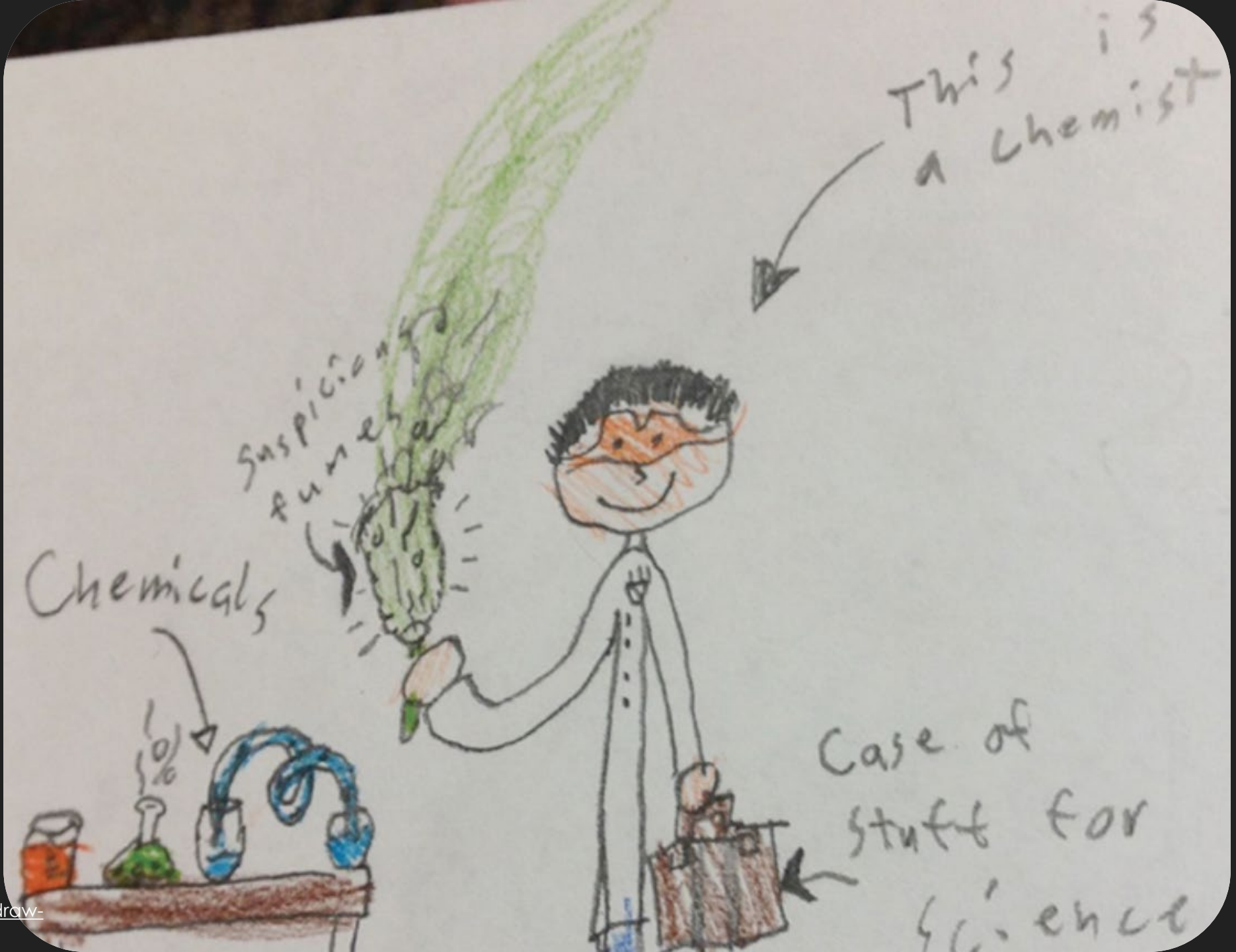


Draw a Scientist Project

Percentage of students who draw a male scientist

Both boys and girls are more likely to draw a male scientist as they get older.



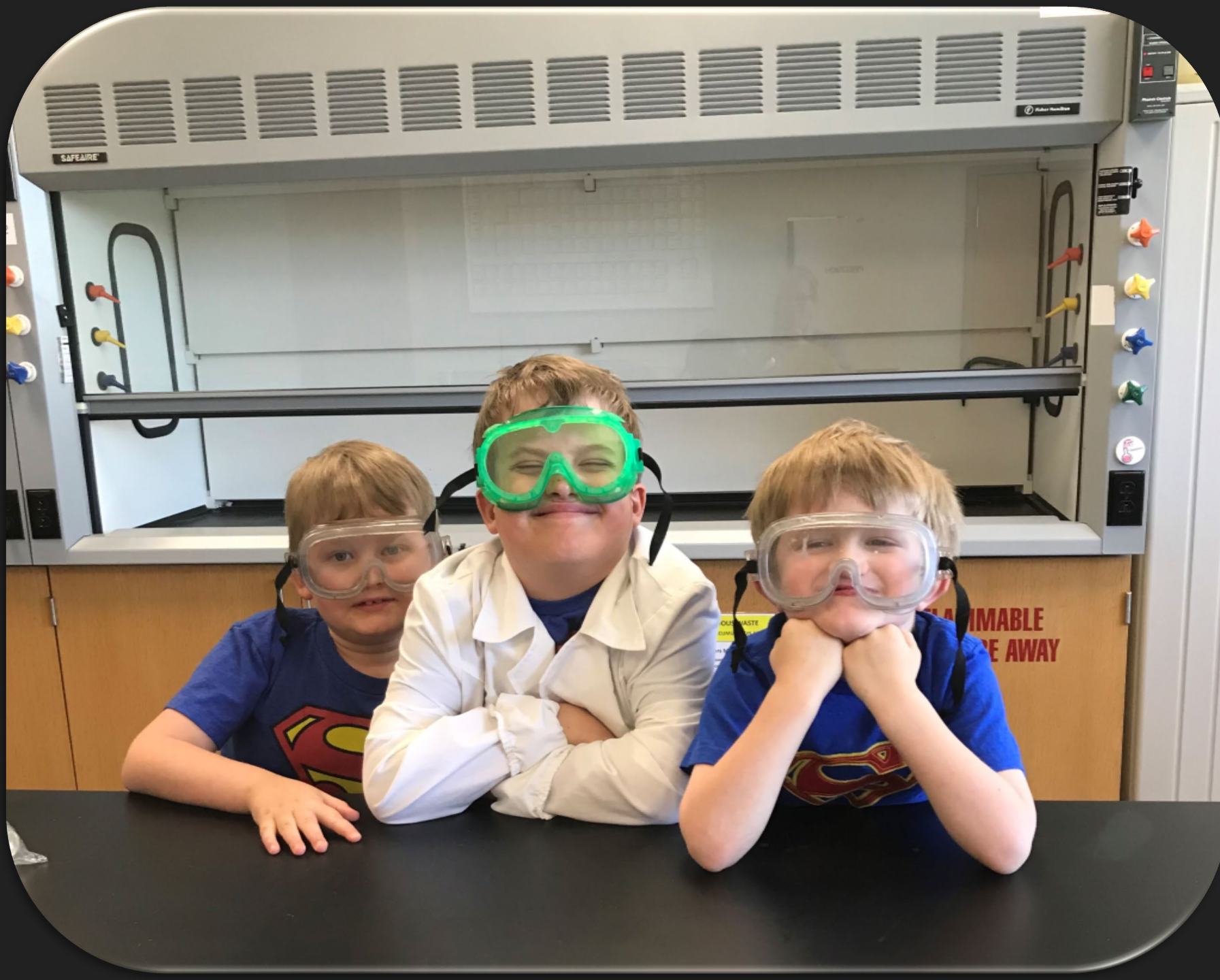


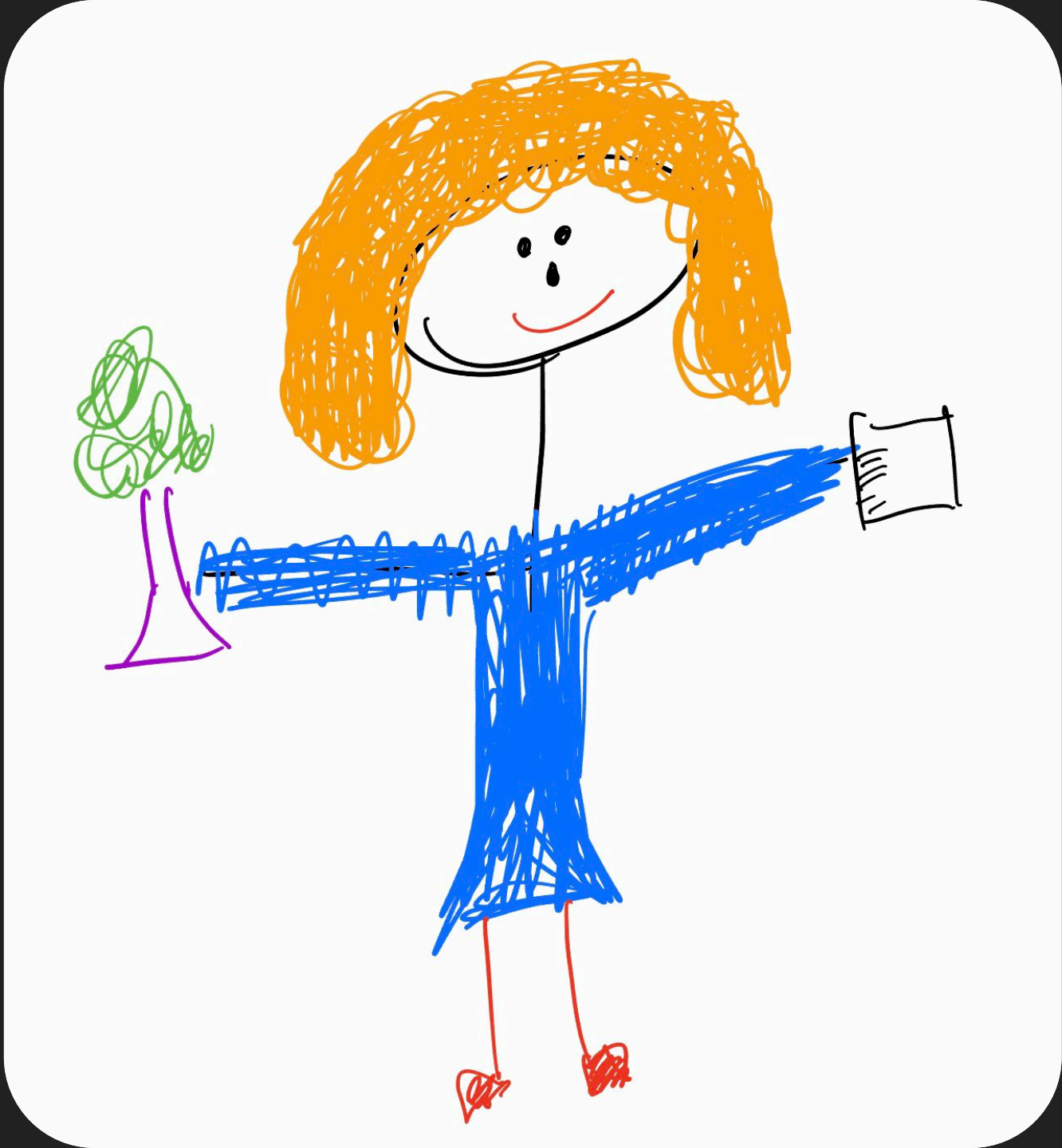
This is a Chemist

Suspicious & funny

Chemicals

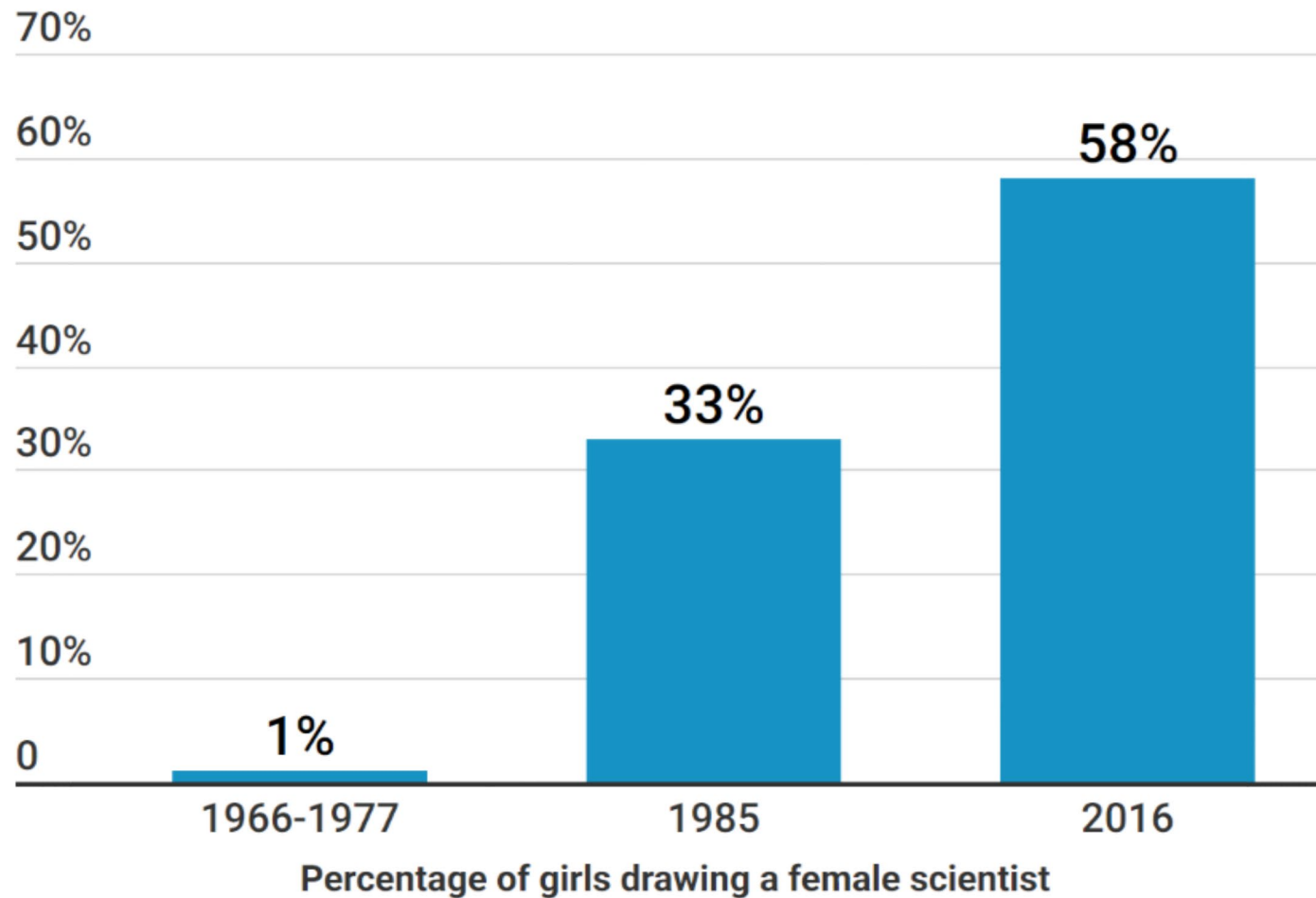
Case of stuff for science





50 Years of “Draw-A-Scientist” Studies

Today, **more than half of girls draw a woman when asked to draw a scientist**, a number that’s risen steadily since the 1960s.





**INVISIBLE
WOMEN**

BUSINESS
BOOK OF THE
YEAR 2019
WINNER

FT
McKinsey & Company

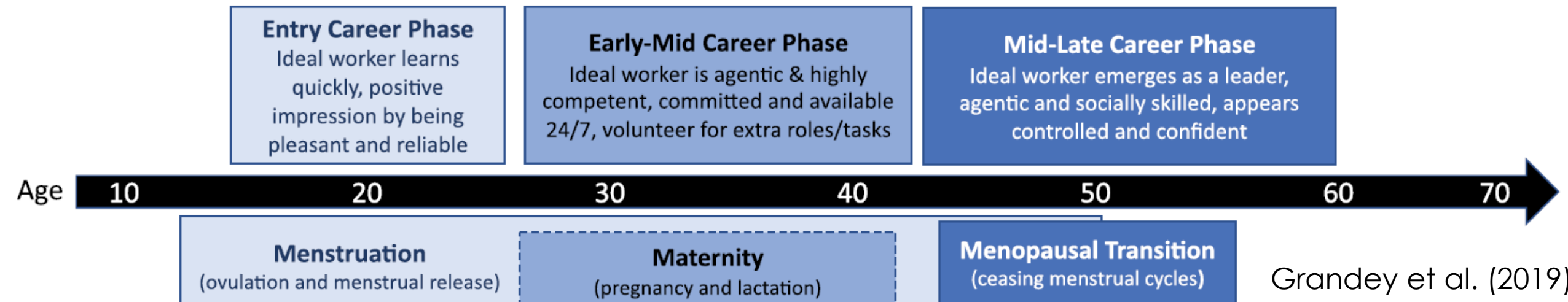
**DATA BIAS IN A WORLD
DESIGNED FOR MEN**

CAROLINE CRIADO PEREZ

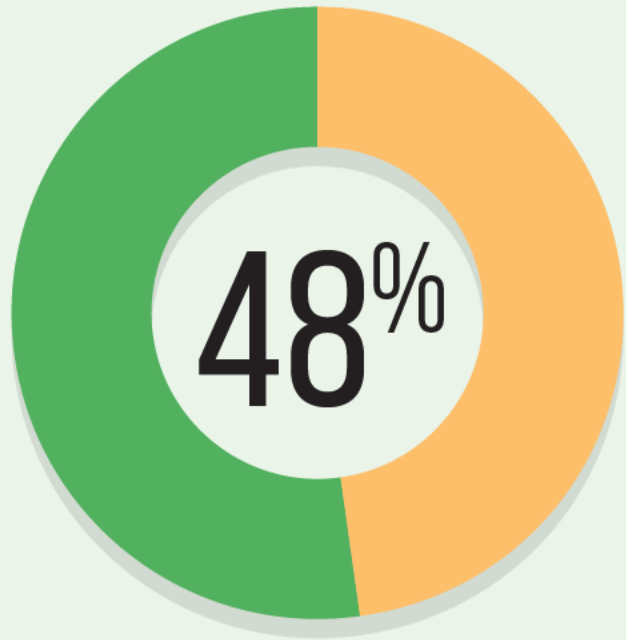
Challenges & Inequities

Challenges of being a Woman in STEM

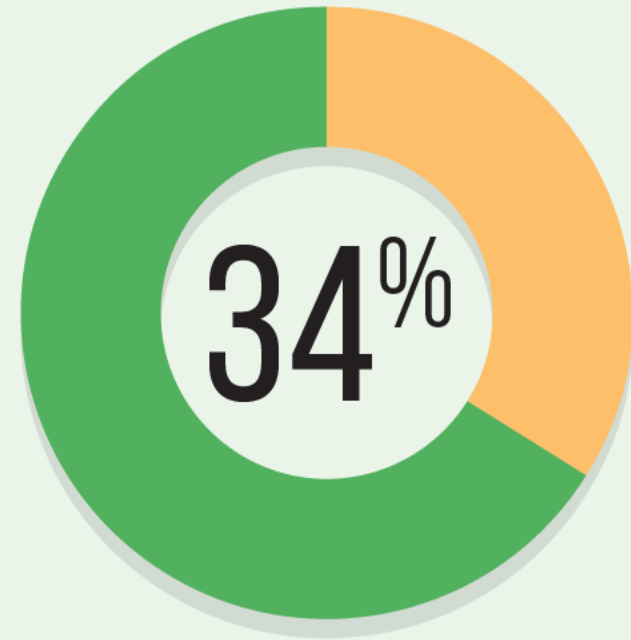
- Emotional Labor
- Mental Labor
- Three M's



STEM Workforce



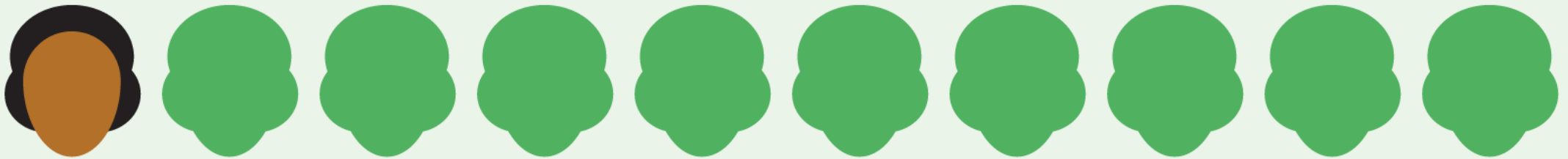
Women constitute 48% of the total workforce.



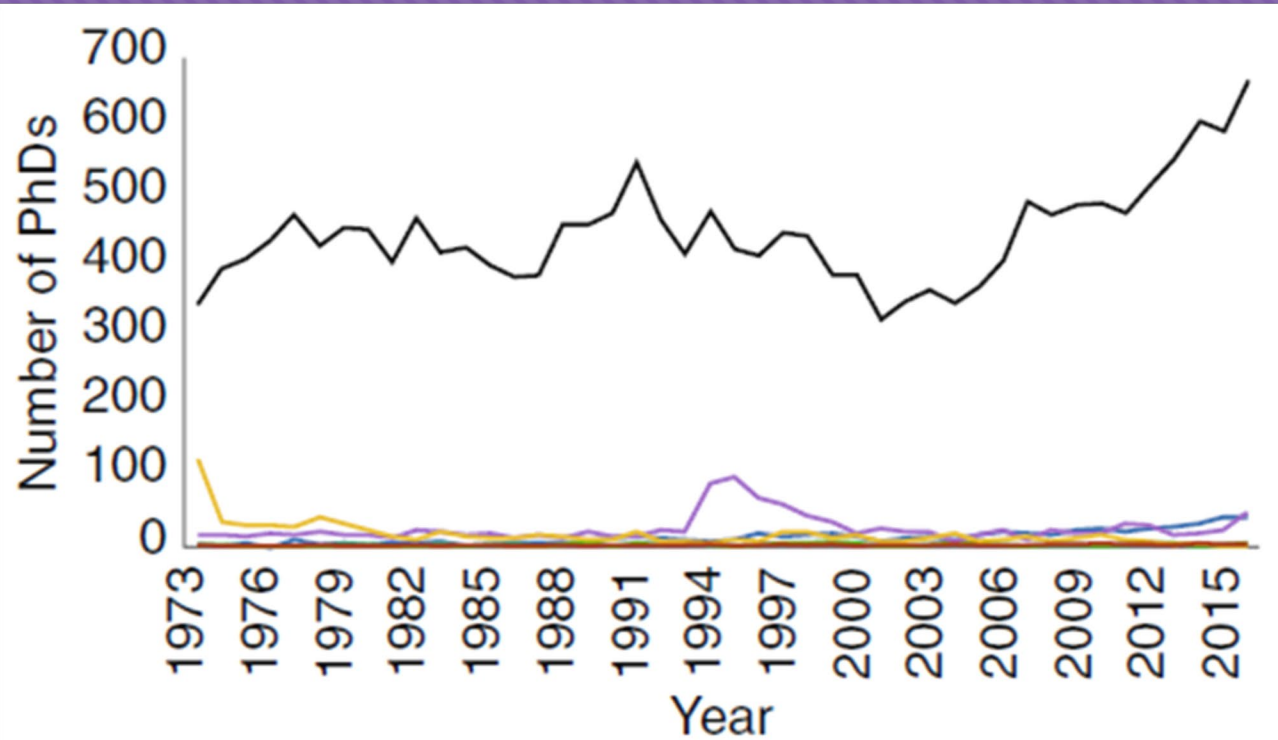
Women constitute 34% of the STEM workforce.

STEM Workforce

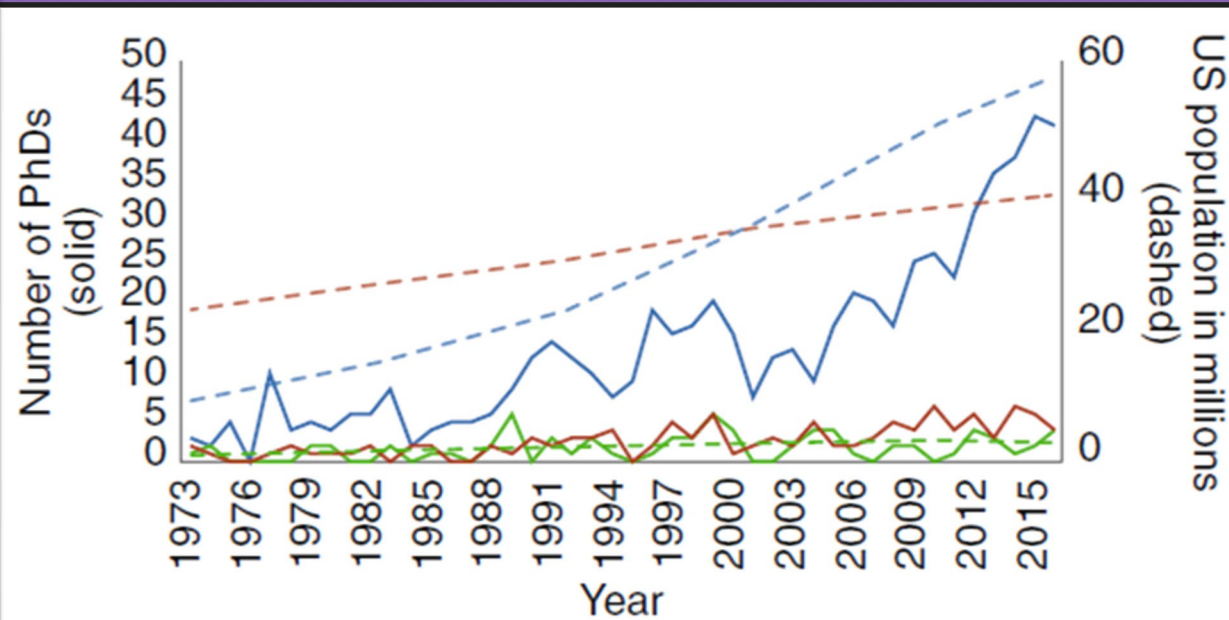
Latina, Black, and Indigenous women represent **less than 10% of the STEM workforce.**



Intersectionality Impacts: Earth Science Example

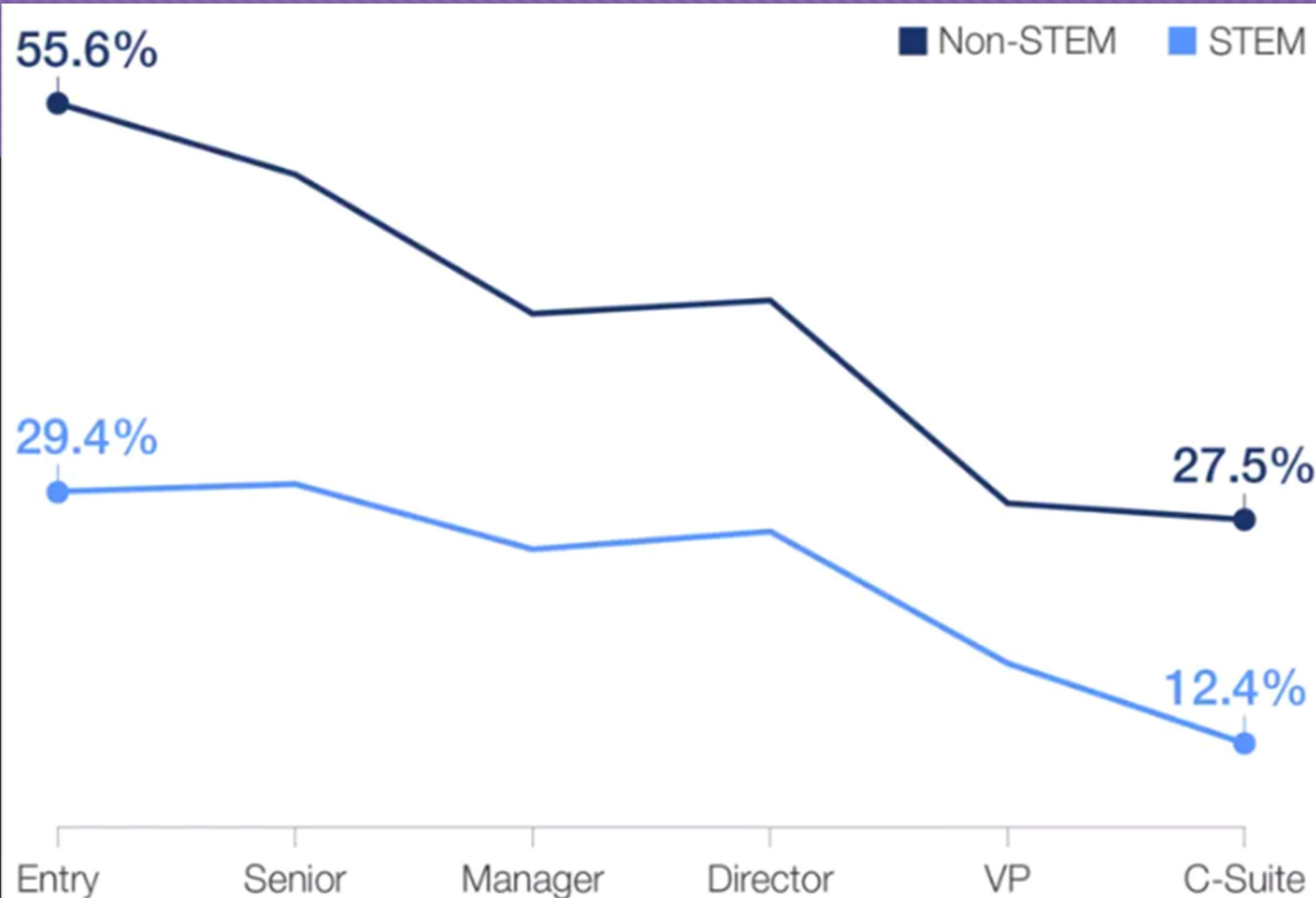


- White, non-Hispanic
- Native American, non-Hispanic
- Asian, non-Hispanic
- Black, non-Hispanic
- Hispanic or Latino
- Other or unknown



- Geoscience PhDs
- US Population
- Hispanic or Latino
- Native American, non-Hispanic
- Black, non-Hispanic

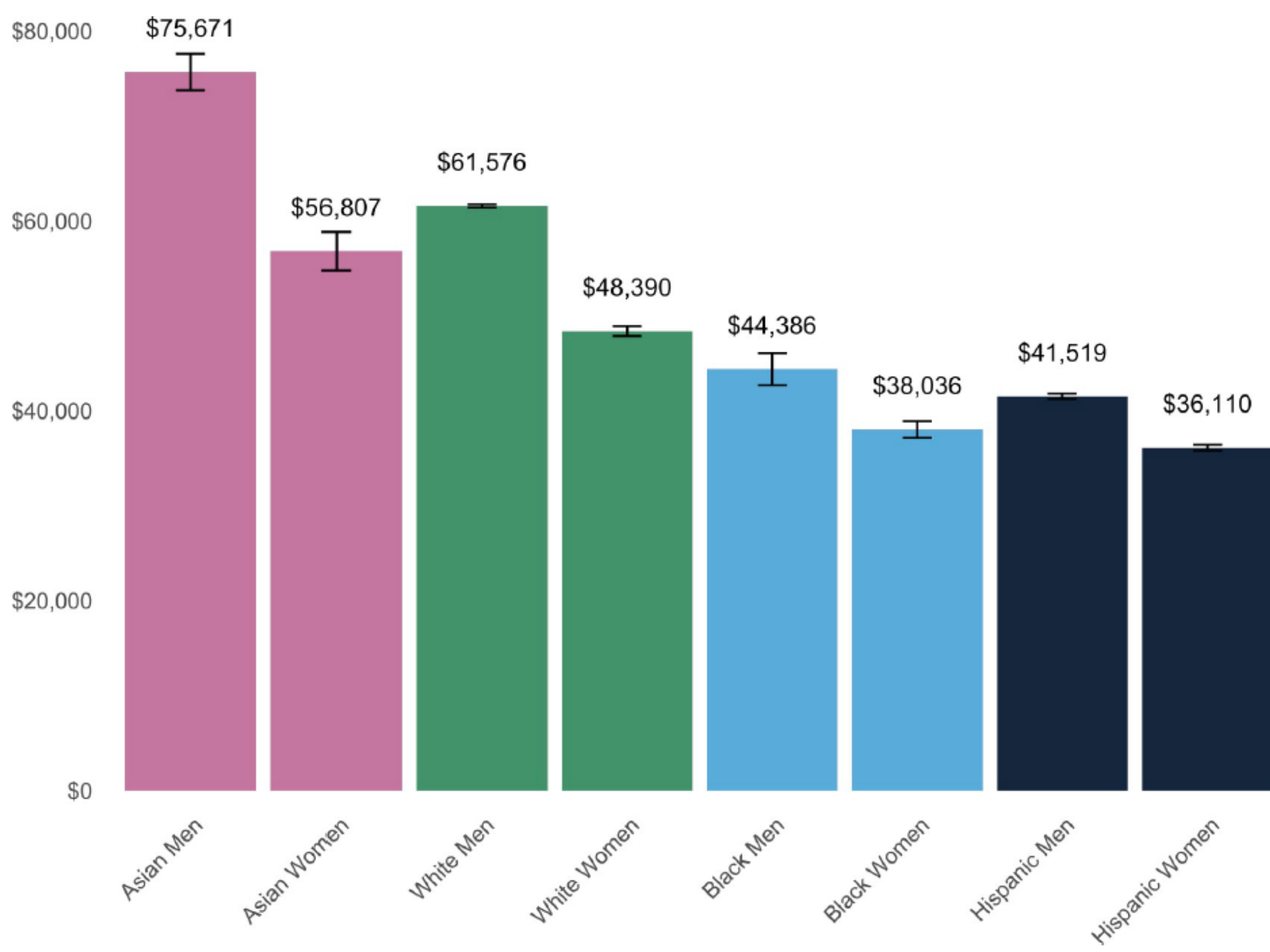
Women in Leadership Roles



World Economic
Forum, Global
Gender Gap Index
2023

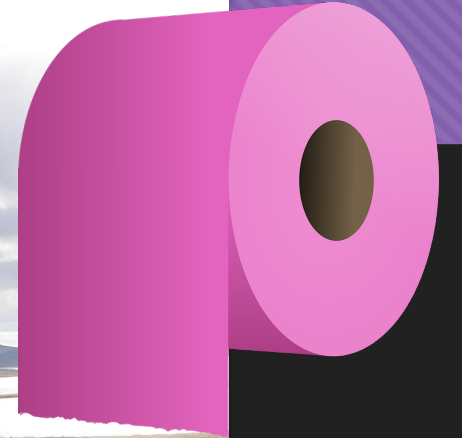
Pay Gaps

Median Earnings for
15 years+
From US Census Data



Field Challenges

Field Work & the Three M's



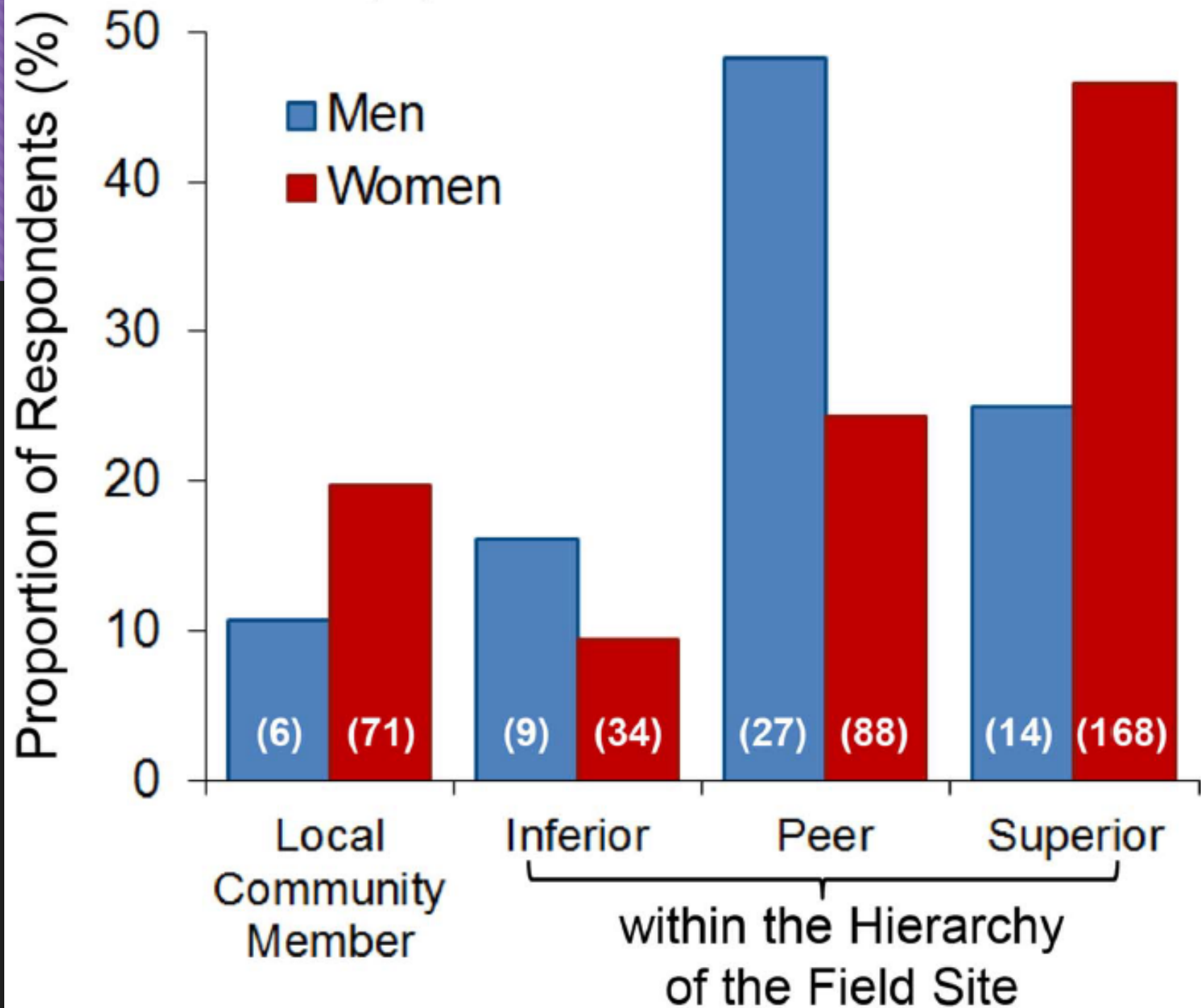
Field Work & the Three M's



Field Work & Harassment

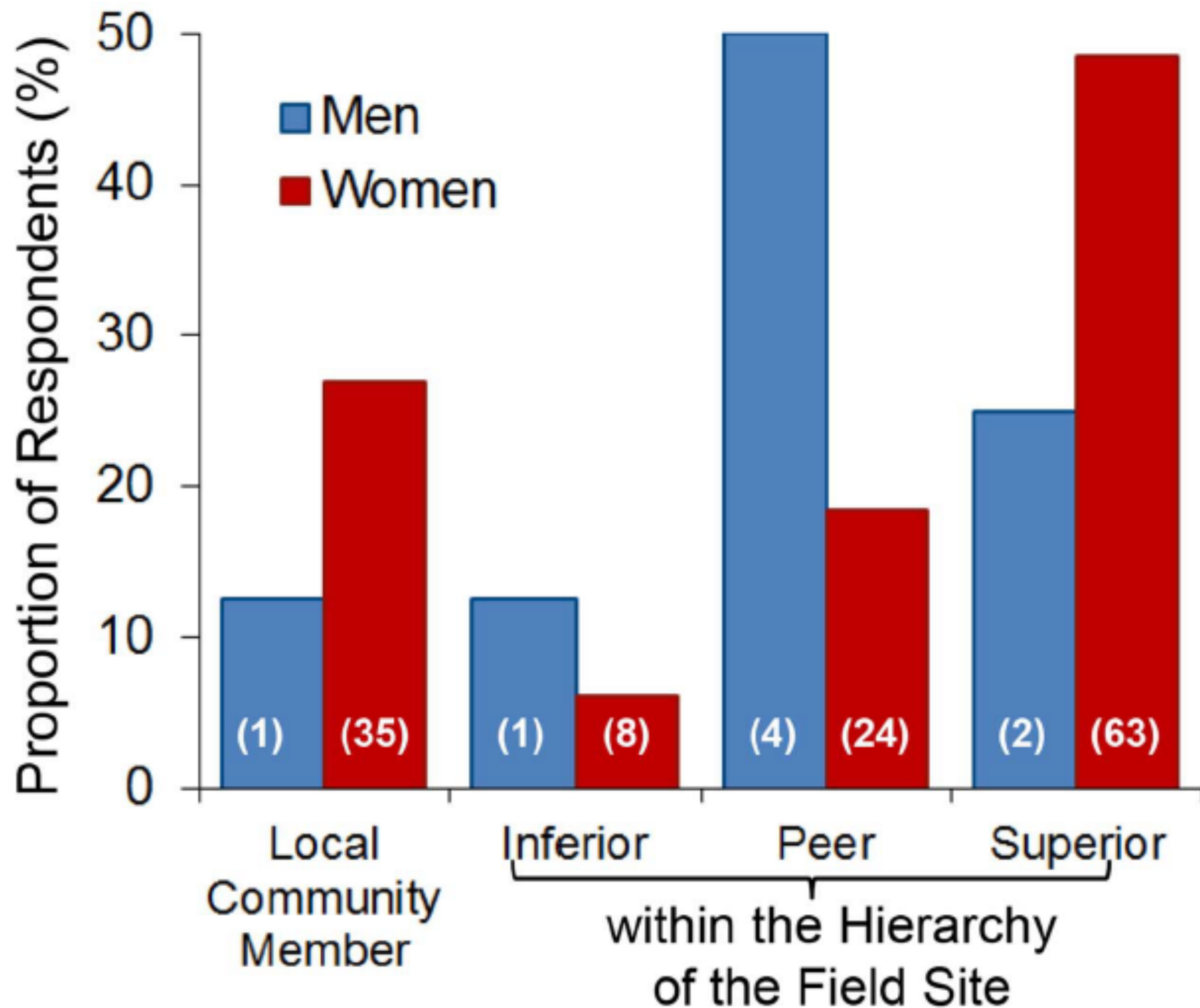
Sources of Comments

Clancy et al. (2014)



Field Work & Harassment

Sources of Unwanted Contact



Field Work & Harassment

“Every woman I knew down there had an assault or harassment experience that had occurred on ice.”

“I think we need some sort of system in place to have an educational or correctional program when these incidents occur to actually teach people why what they are doing is wrong.”



National Science Foundation (NSF)
Office of Polar Programs (OPP)
United States Antarctic Program (USAP)

Sexual Assault/Harassment Prevention
and Response (SAHPR)

FINAL REPORT

June 22, 2022



Field Work & Harassment

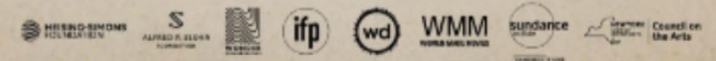


Jane Willenbring, Ph.D.

PICTURE A SCIENTIST



AN UPSWING PRODUCTION | IN ASSOCIATION WITH THE WONDER COLLABORATIVE | A FILM BY SHARON SHATTUCK AND IAN CHENEY - PICTURE A SCIENTIST
EXECUTIVE PRODUCER AMY BRAND | EDITED BY NAJASHA BEED | CO-PRODUCERS IRENE MADAO AND OLIVIA WILSON BARCELONA
PRODUCED BY MANETTE POTTLE, IAN CHENEY, SHARON SHATTUCK | DIRECTED BY IAN CHENEY AND SHARON SHATTUCK



pictureascientist.com

Illustrations by Sean McCreary | Poster Design by CD Morgan

Lab Challenges

Risk for pregnant researchers in the chemical laboratory

HAZARD



VULNERABILITY



EXPOSURE



Risks in the Laboratory



Biological Hazard



Health Hazard

Teratogens
Fetotoxins
Carcinogens
Neurotoxin
Heavy metals
Radiation



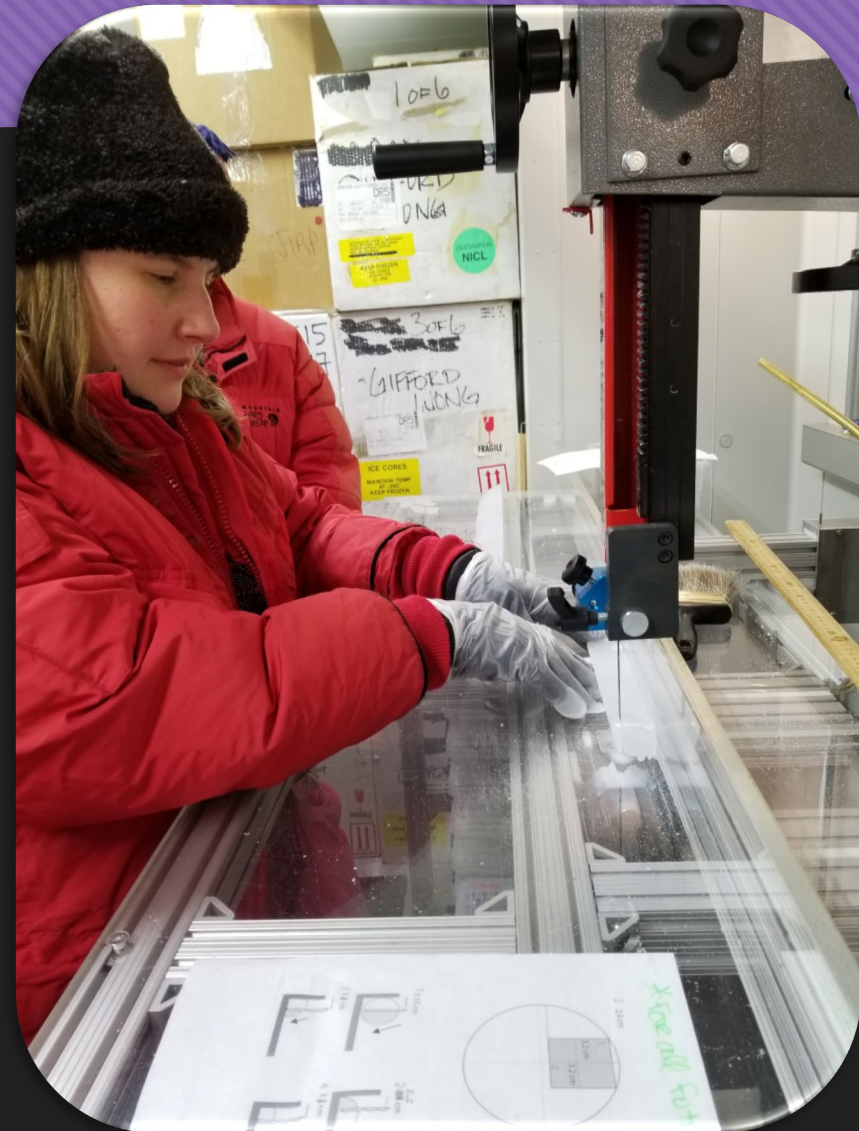
Poison



Radiation Hazard

Creating Success in STEM

Traits of Women in STEM



Ruling Our Experiences Reports



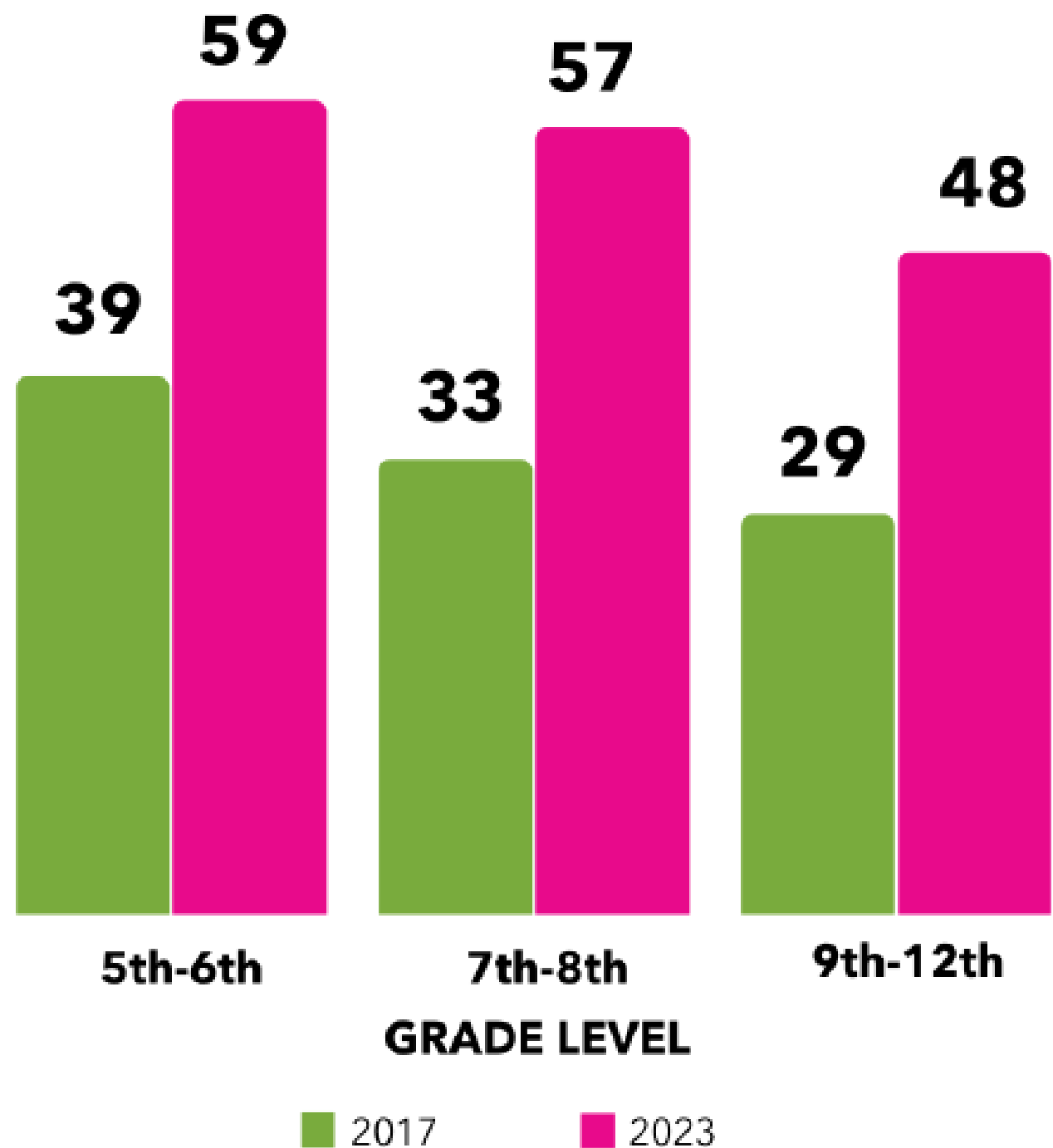
- 2017 – over 10,000 girls surveyed
- 2023 – over 17,000 girls surveyed

% Girls afraid to lead, because don't want to be thought of as bossy



2023 Full Report

% of girls who are afraid to be leaders because they don't want people to think they are bossy

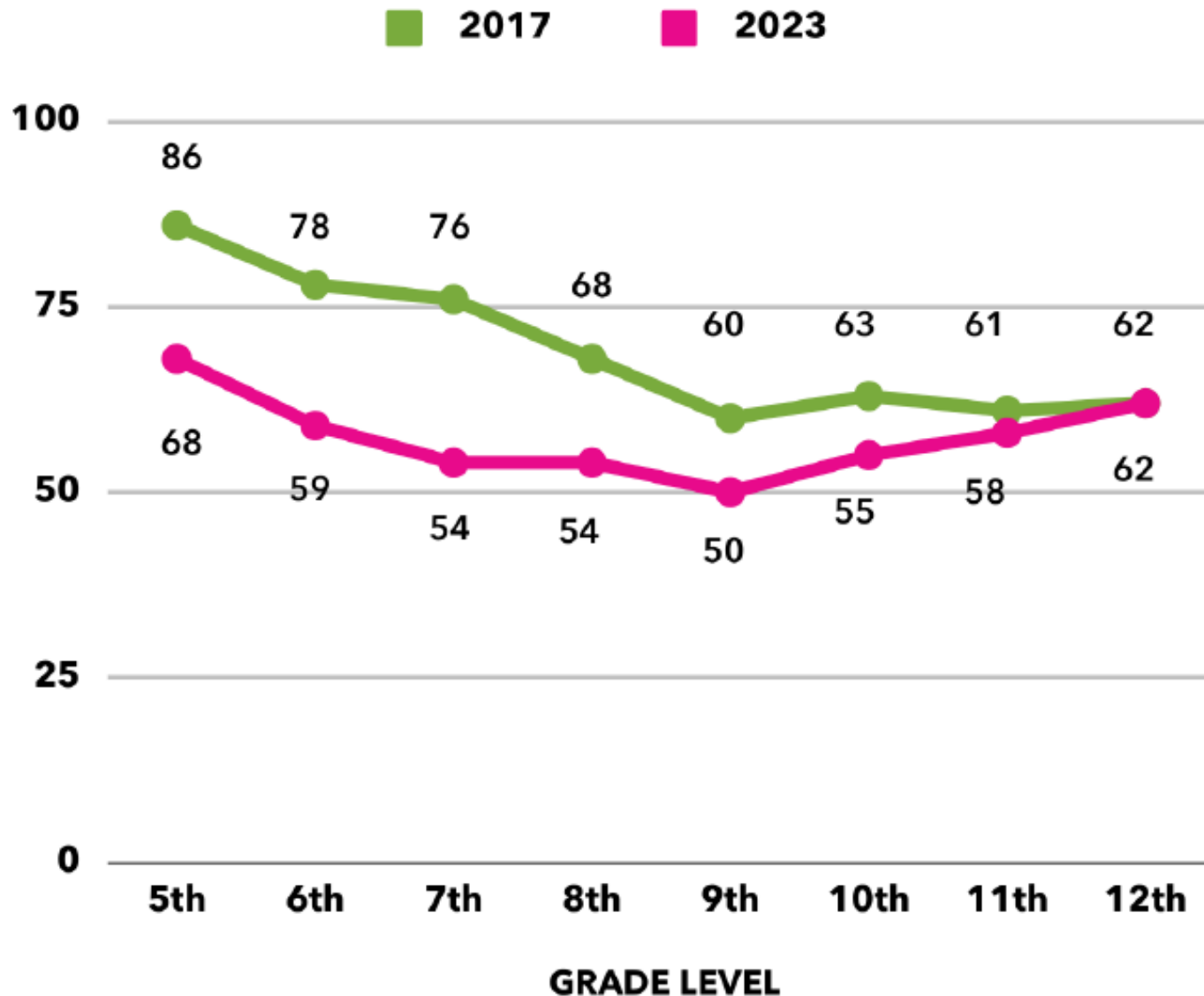


% Girls describing themselves as confident

2023 Full Report



% of girls who describe themselves as confident



GIRLS WHO LIKE THEIR BODY "THE WAY IT IS" ARE NEARLY

10x

MORE LIKELY TO BE CONFIDENT

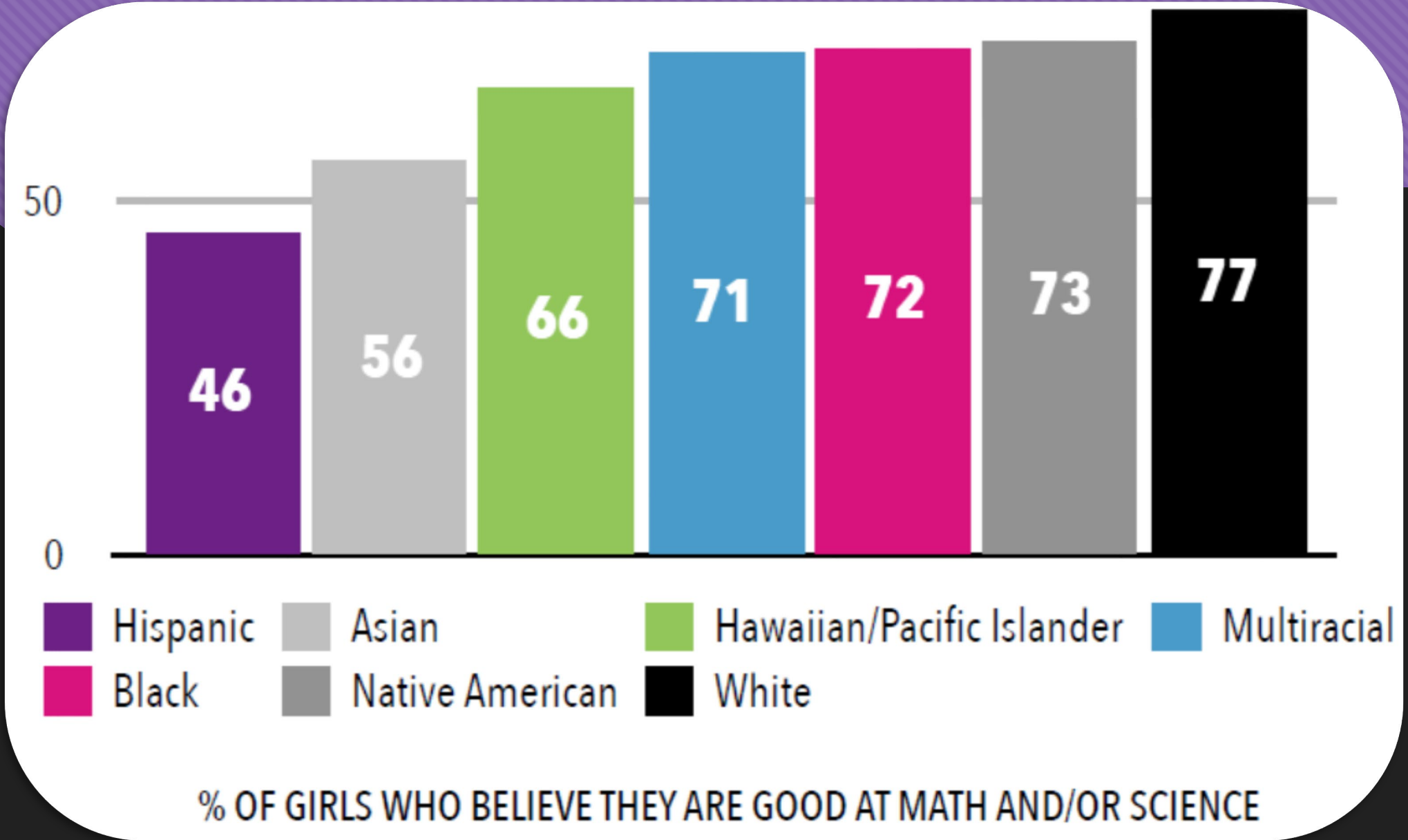
Confident girls are *more likely* to:

- **Feel that school is a place where they belong**
- **Believe that they can be their “true self” at school**
- **Get along well with other girls**
- **Have supportive adults in their life**
- **Like trying new things**
- **Speak their mind**
- **Want to lead**





2017 STEM Impact Report

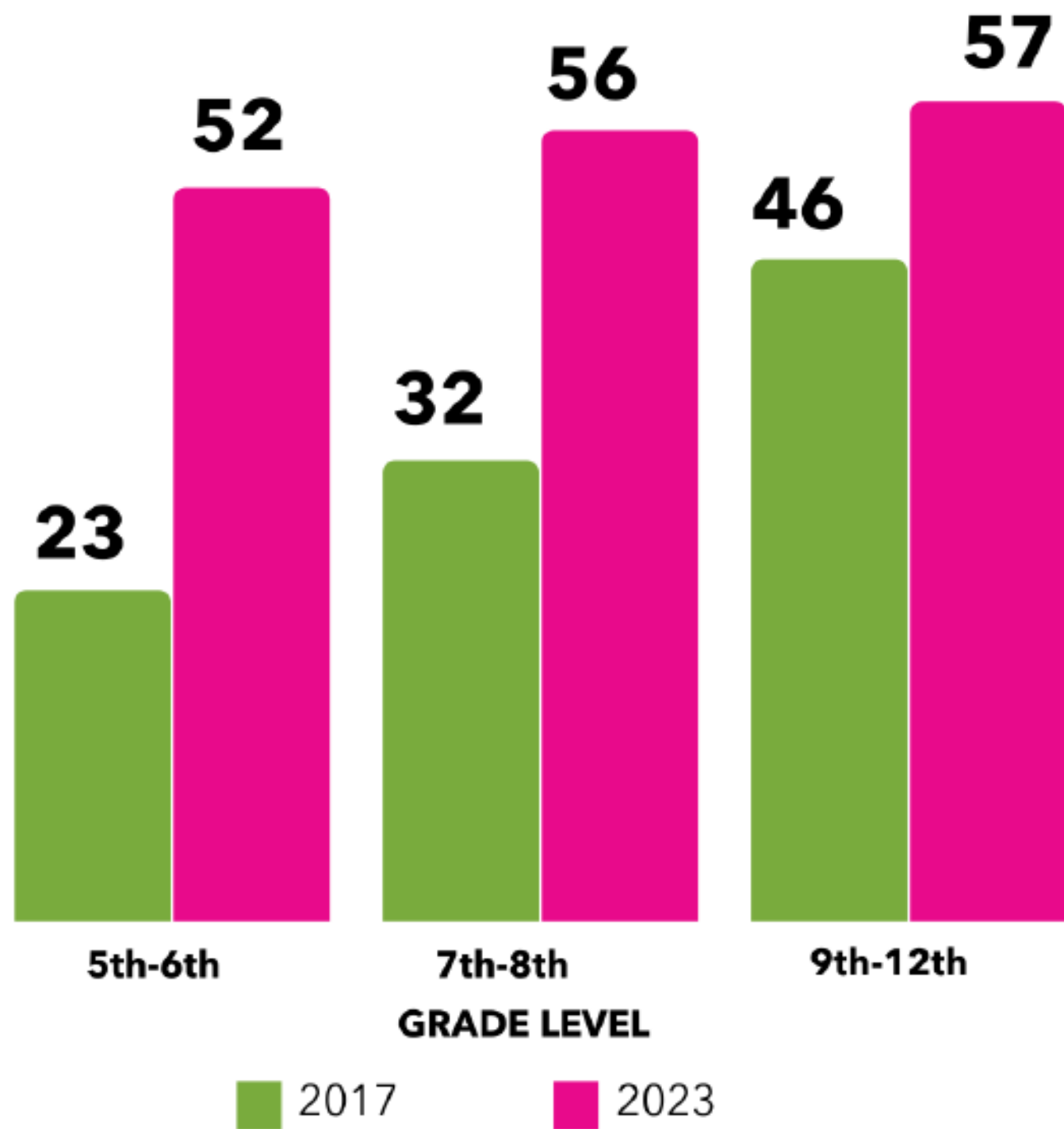


% Girls who are not sure if smart enough for dream career

2023 Full Report



% of girls who are not sure if they are smart enough for their dream career

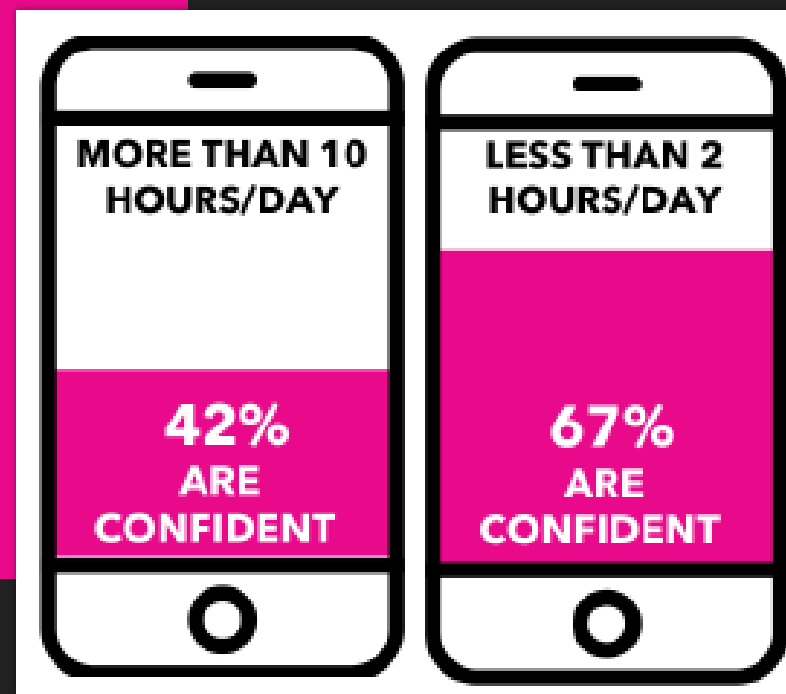


Girls who *less* social media are *more likely* to



2023 Full
Report

- Report lower levels of sadness and depression
- Be involved in extracurricular or enrichment activities like sports, music, clubs and troops
- Have supportive friends
- Like going to school
- Be happy with their body and appearance



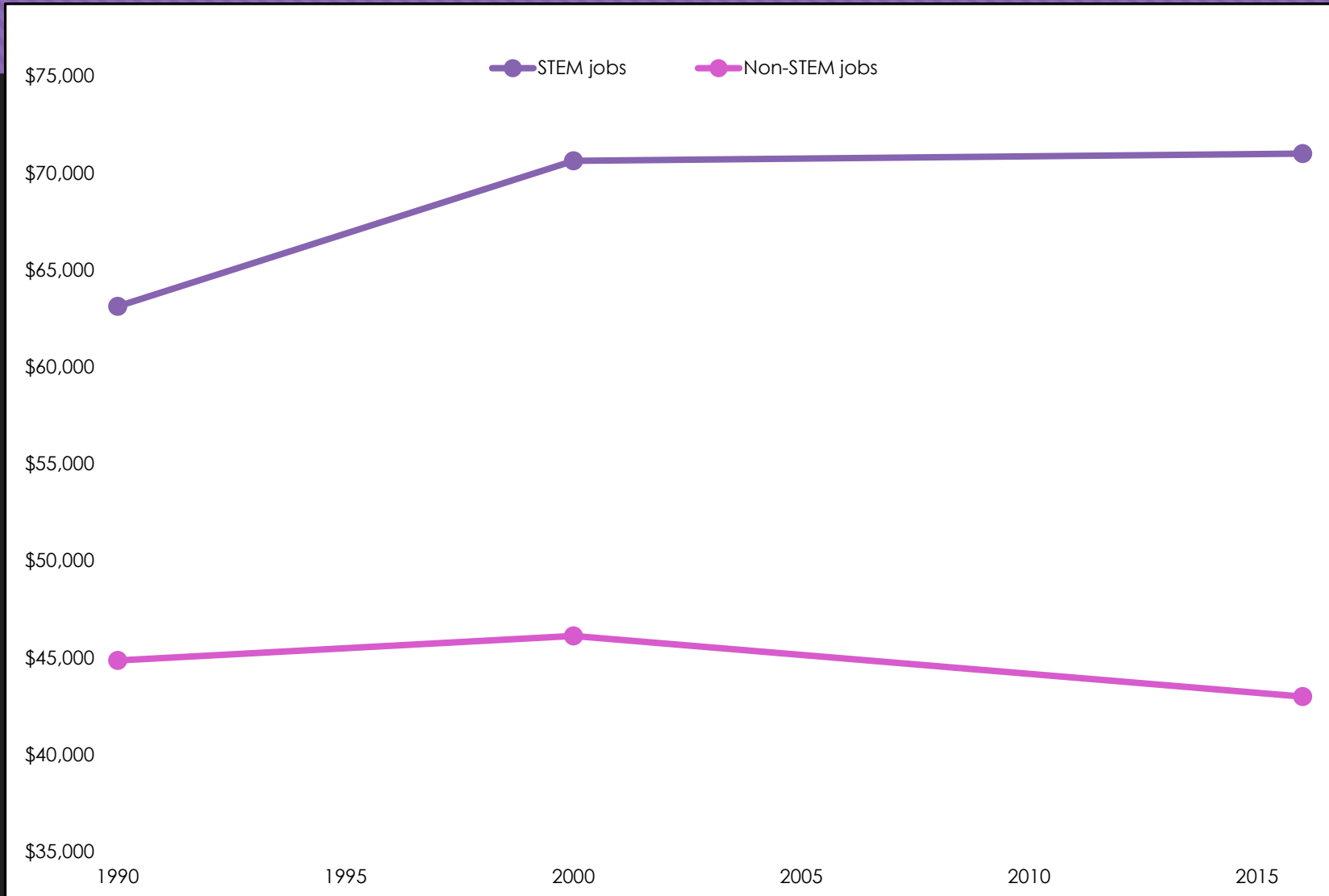
GIRLS WHO DO NOT LIKE
COMING TO SCHOOL ARE

40%

LESS LIKELY TO REPORT
THAT THEY ARE
CONSIDERING A CAREER
IN A STEM SUBJECT



STEM jobs = more \$



Median annual earnings of full-time, year-round workers ages 25 and older (in 2016 \$).

**A Girl's interest in
pursuing a career
in math/science is:**

2017 STEM Impact



11% GREATER

IF SHE PLAYS SPORTS

8% GREATER

IF SHE IS PART OF A YOUTH
GROUP OR RELIGIOUS
ORGANIZATION

7% GREATER

IF SHE HAS A PAYING JOB

5% GREATER

IF SHE PARTICIPATES IN
MUSIC, BAND OR THEATRE

Growth Mindset



Dear future women of STEM

“There’s nothing wrong with you if you fail.”

“Speak up, be proud, and don’t be afraid to make mistakes.”

“Don’t give up, find what motivates you, find what makes you happy, relieve stress and keep moving forward. The journey won’t be easy but girl, you got this.”

“Everyone struggles with certain things and you are not alone in that.”

“Make your peers your allies, not your competition.”

Thanks Mentors!

