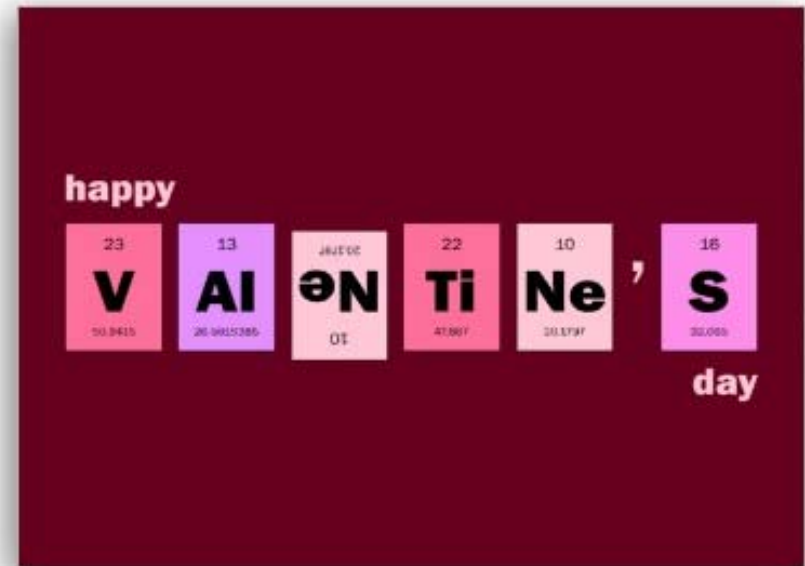


Welcome!

- Please introduce yourself, organization, and Collaborative in the chat box.
- Any special plans for Valentine's Day?



February 14, 2018



Agenda

- Happy Valentine's Day!
- Presentation: Addressing intersectionality and racial inequity in STEM
- Discussion
- Sharing from the PA Girls Collaborative
- Community Updates
- Closing

Hey Science,



You spin us right round baby,
right round, like a centrifuge
vigorously separating particulate
matter from a solution, right
round round round.

Happy Valentine's Day!



Dr. Mary Fernández





Understanding Intersectionality

Mary Fernández

mff@maryfernandez.com

Credit. NYTimes 3/5/2017. With artist's permission. Lynn Z. lynnie.zulu@gmail.com

Scissors work well

Pens and pencils are easy
to use

Folding desks help you take
notes

Softball mitts are easy to
find

Picture diagrams in
instructions are helpful

Right-Handed

Scissors work well

Pens and pencils are easy to use

Folding desks help you take notes

Softball mitts are easy to find

Picture diagrams in instructions are helpful



Left-Handed

Scissors don't cut well

Pens and pencils smear as you write

Folding desks don't support your arm

Softball mitts are hard to find

Picture diagrams are backwards



Right-Handed is just regular; it's normal



Left-Handed is different; it's “backwards”; it's unusual



Dominant in society at large



Non-dominant

Credit: Liesl Chatman, Director of Professional Development, Science Museum of Minnesota



Access to Power and Privilege

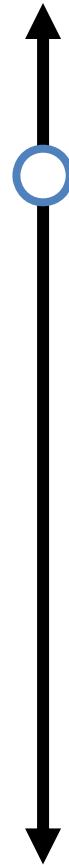


Defined by Dominant as “Other”



Access to Power and Privilege

*Can be context
dependent*



*Left-Handed
Batter Against
Right-Handed
Pitcher*

Defined by Dominant as “Other”



Access to Power and Privilege

Lots of right-handed pitchers.

Fewer left-handed batters.

A left-handed batter is more likely to get hit from a right-handed pitcher.

A left-handed batter becomes valuable.

*Left-Handed
Batter Against
Right-Handed
Pitcher*

Defined by Dominant as “Other”



Access to Power and Privilege



Othering

Limits opportunity,
threatens safety,
compromises health,
subordinates identity

Defined by Dominant as "Other"

Access to Power and Privilege

*However, in
general...*

*Left-Handedness
is regarded as
“Other”*



Defined by Dominant as “Other”



When have you been othered or
privileged?

Many Dimensions of Identity

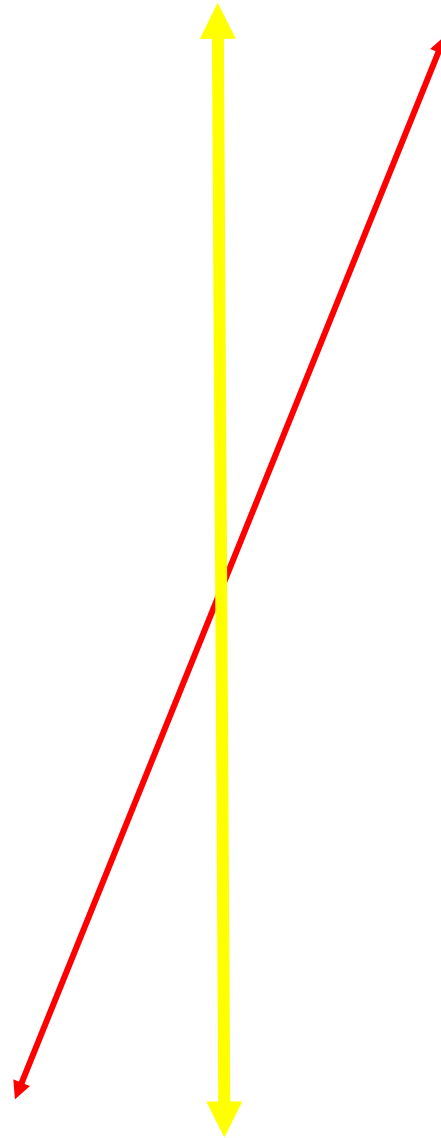
Credit: Liesl Chatman, Director of Professional Development, Science Museum of Minnesota



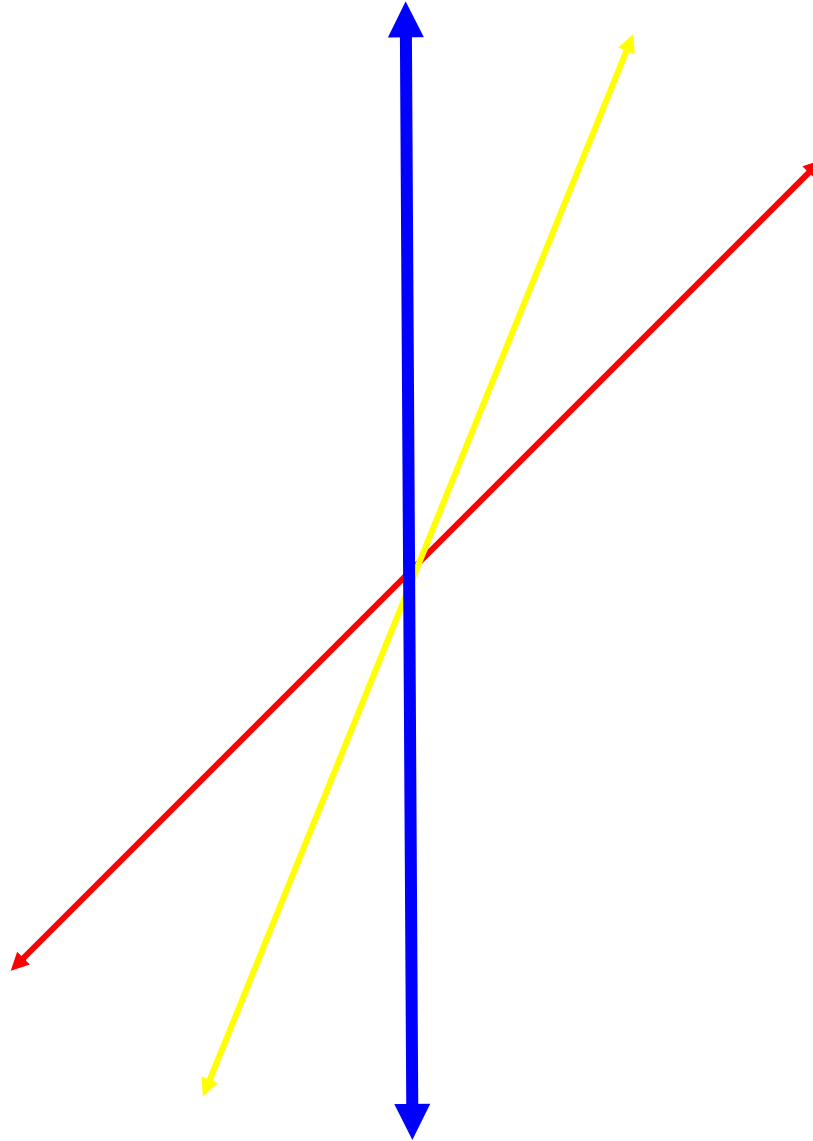
Race

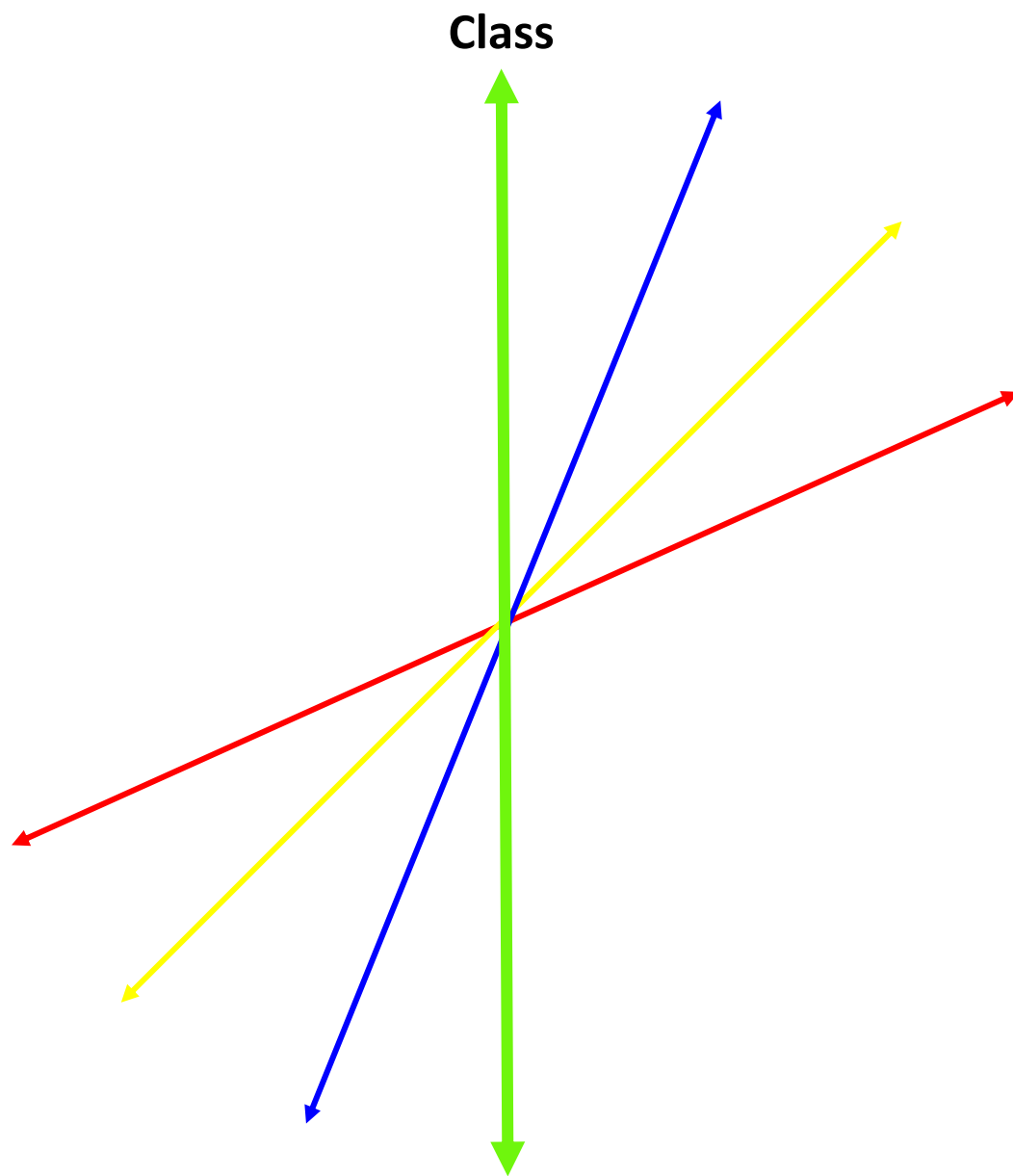


Ethnicity

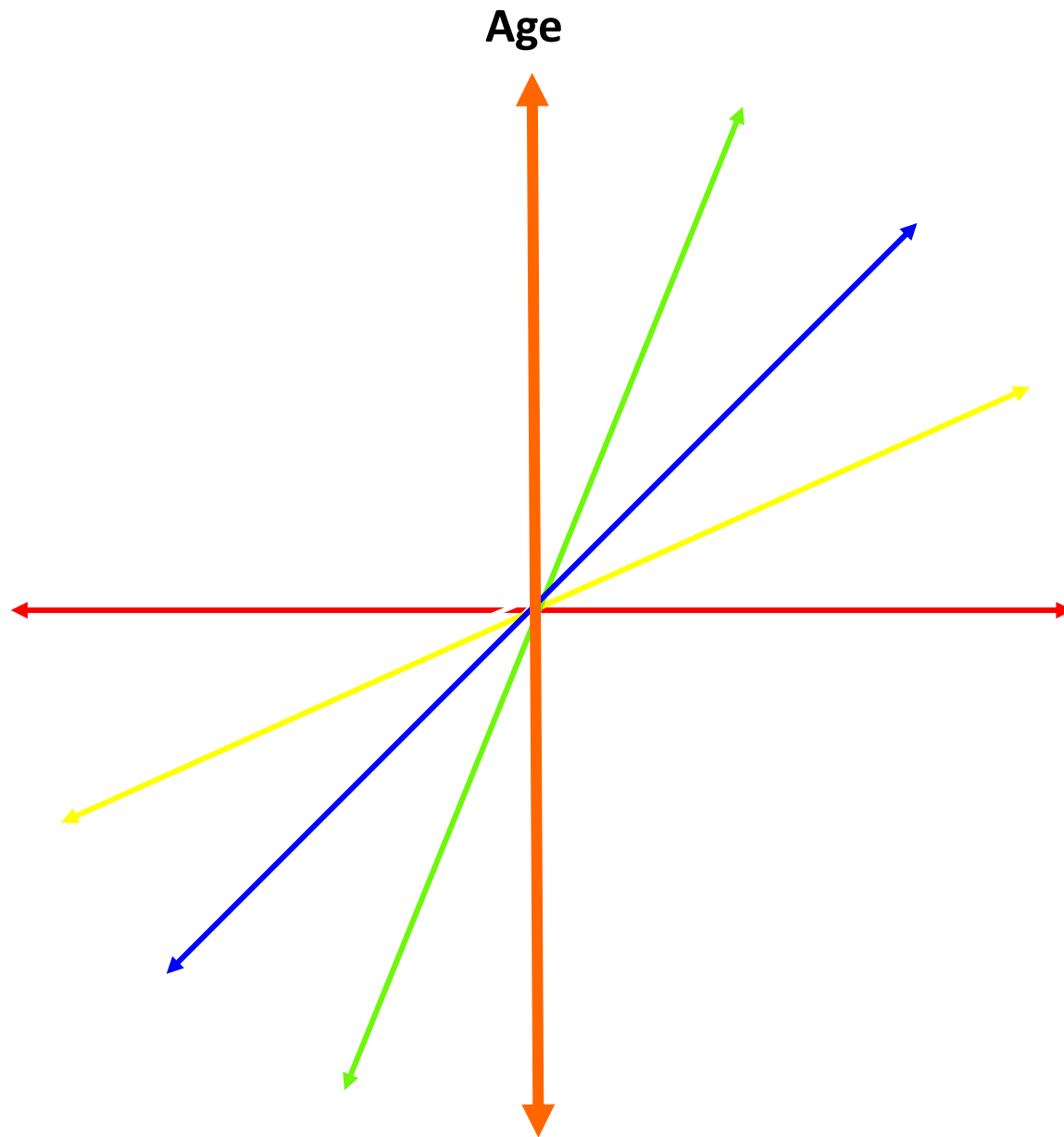


Dis/Ability



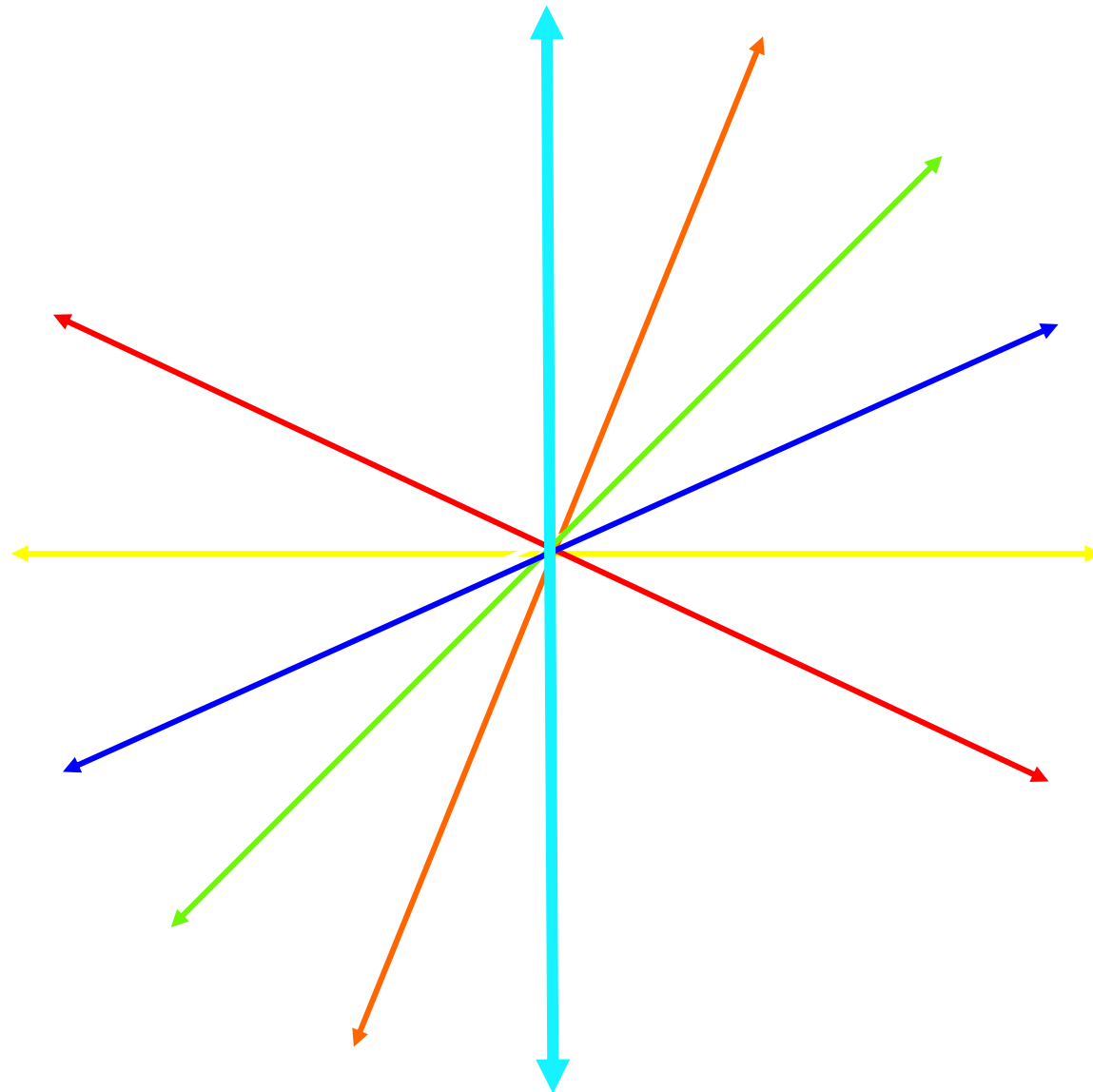


Credit: Liesl Chatman, Director of Professional Development, Science Museum of Minnesota

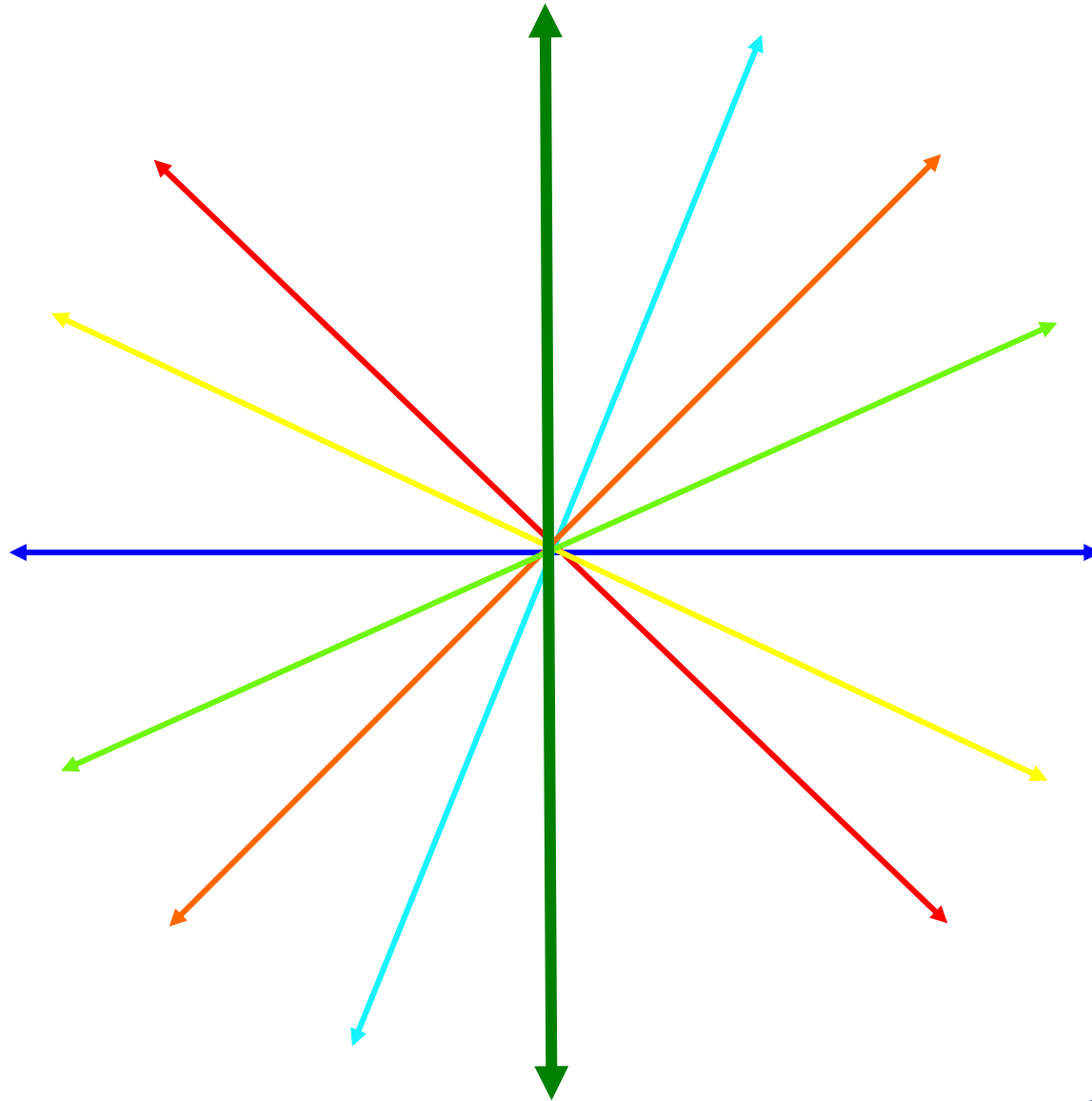


Credit: Liesl Chatman, Director of Professional Development, Science Museum of Minnesota

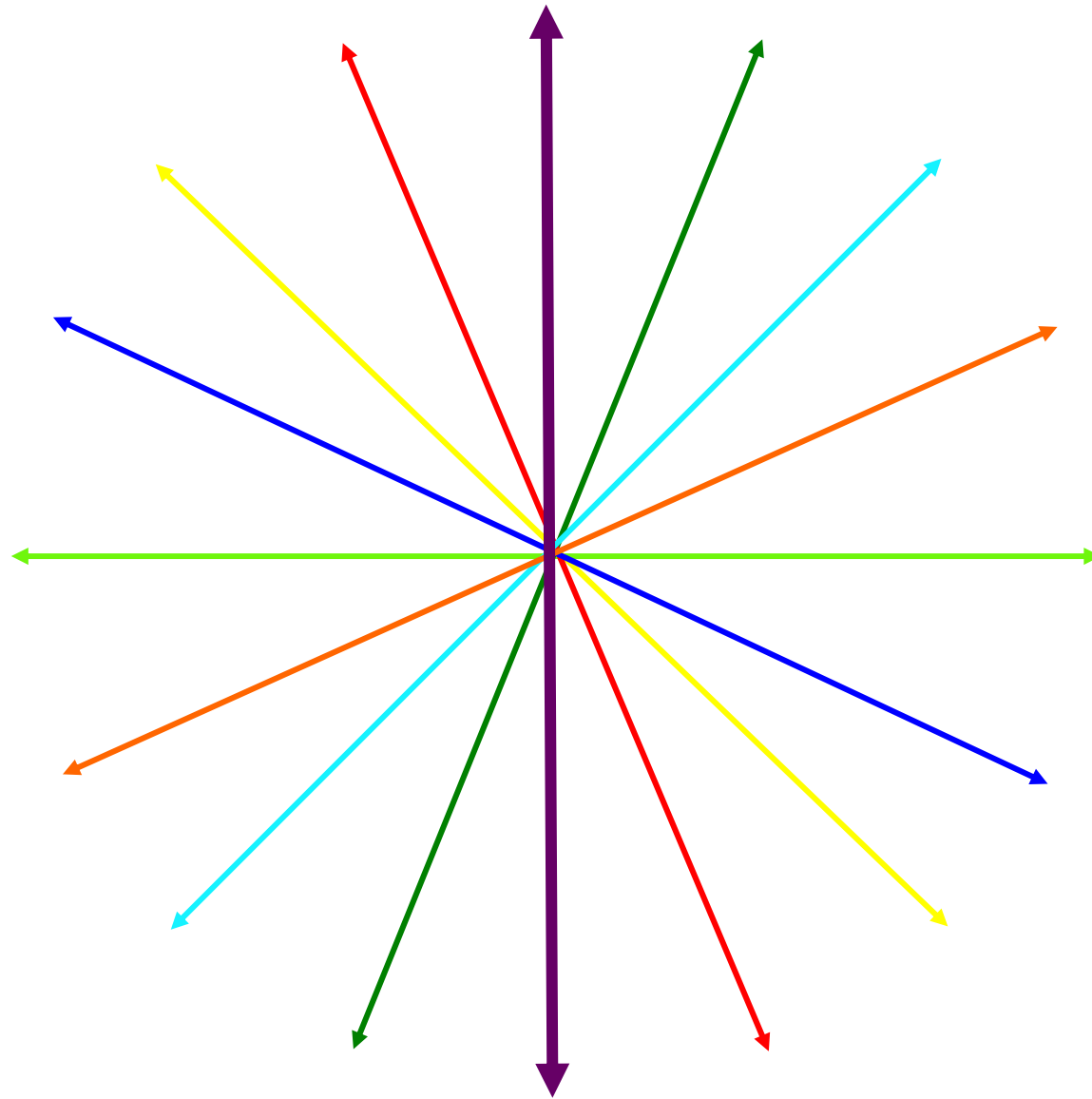
Gender

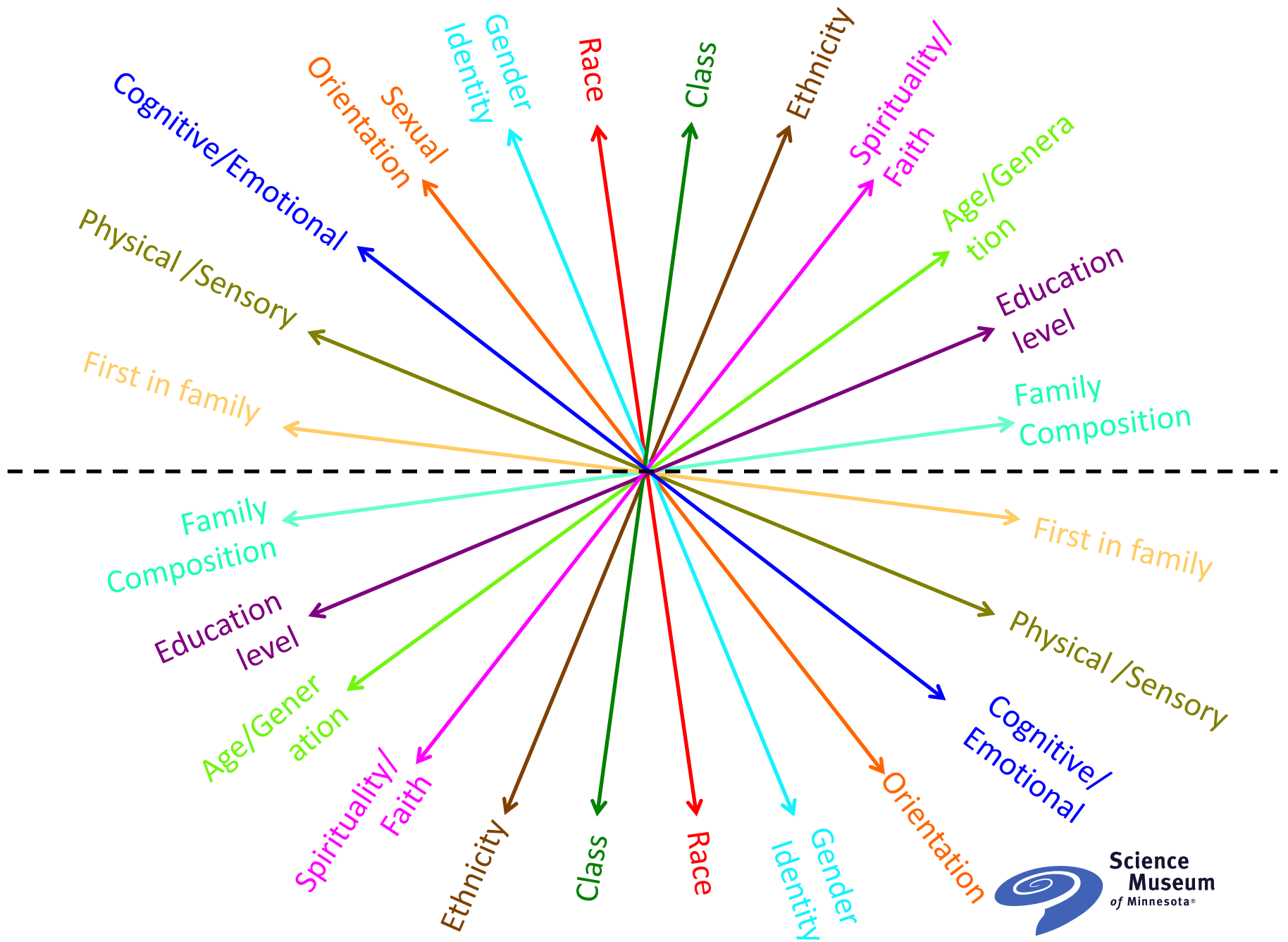


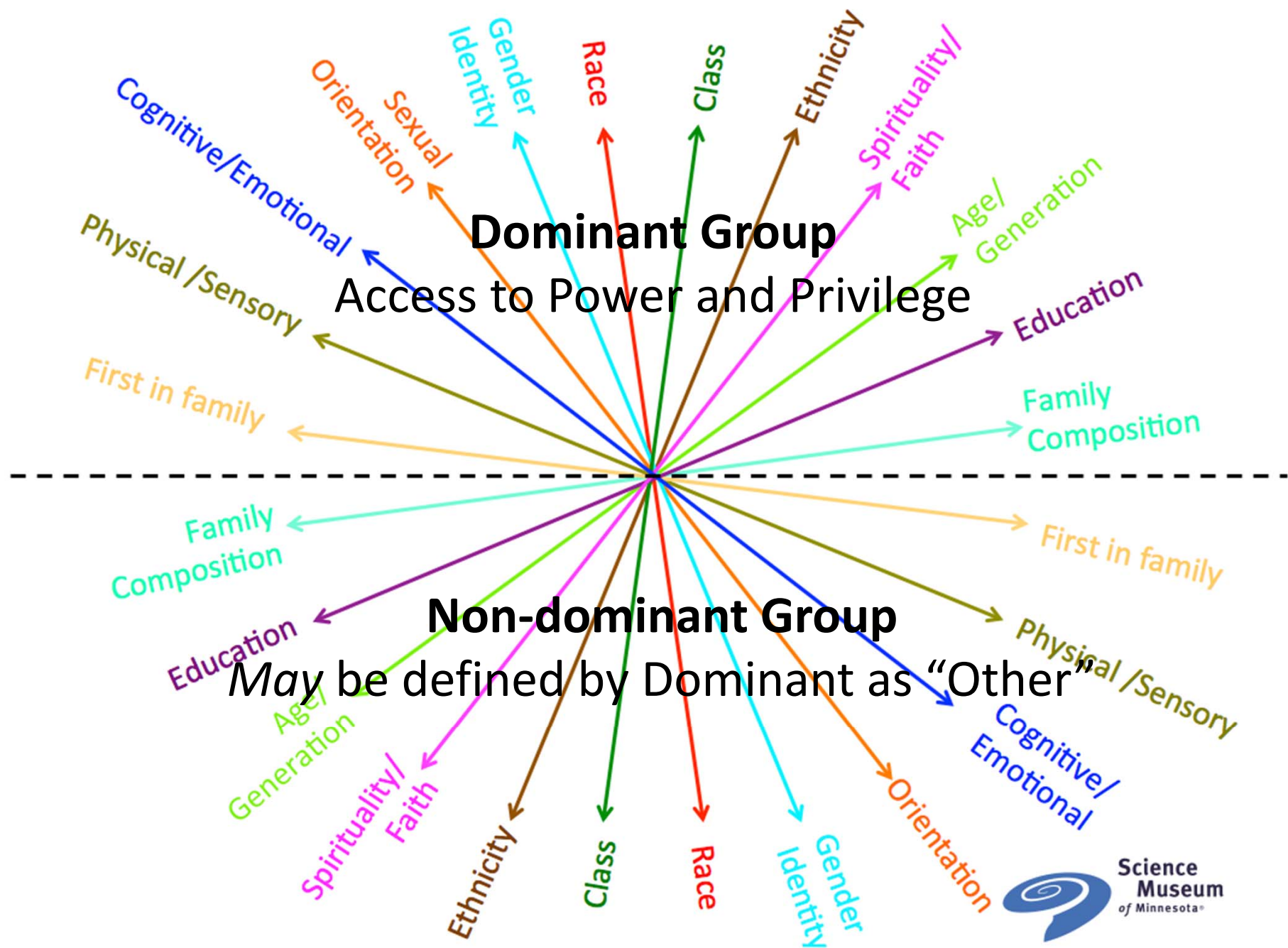
Sexual Orientation



Spirituality

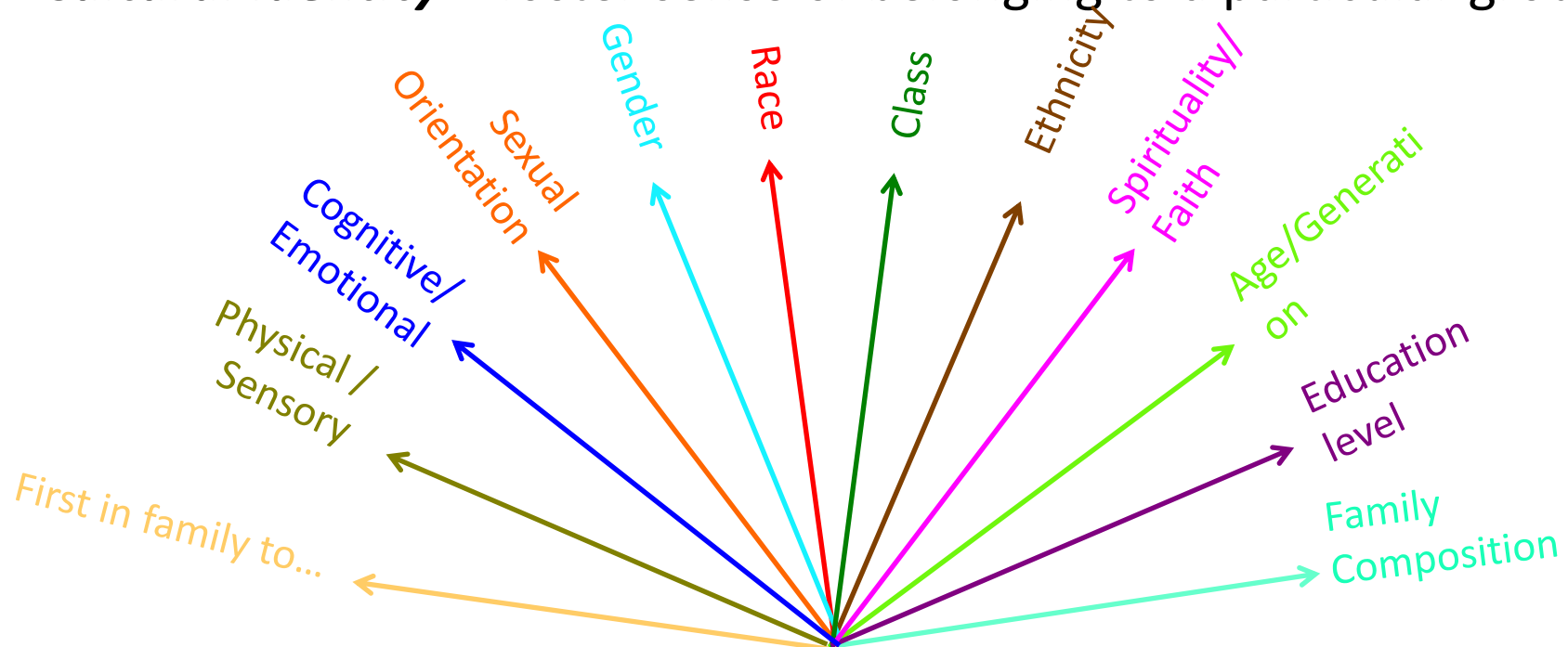






Our Whole Selves

- **Social Identity** – broad, socially-defined categories informed by cultural norms & expectations
- **Self Identity** – dimensions significant to individual. *“My identity is rooted in my history... and I get to say who I am.”*
- **Cultural Identity** – foster sense of belonging to a particular group



Credit: Liesl Chatman, Director of Professional Development, Science Museum of Minnesota

Cultural Humility

- Process and lifelong commitment to self-evaluation and critique to improve relationships and outcomes and to address disparities
- To practice cultural humility is to maintain a willingness to suspend what you know, or what you think you know, about a person based on generalizations about their culture or perceived identity
- What you learn about a person's culture stems from being open to ***what they themselves have determined is their personal expression of their heritage and culture—or their personal culture***

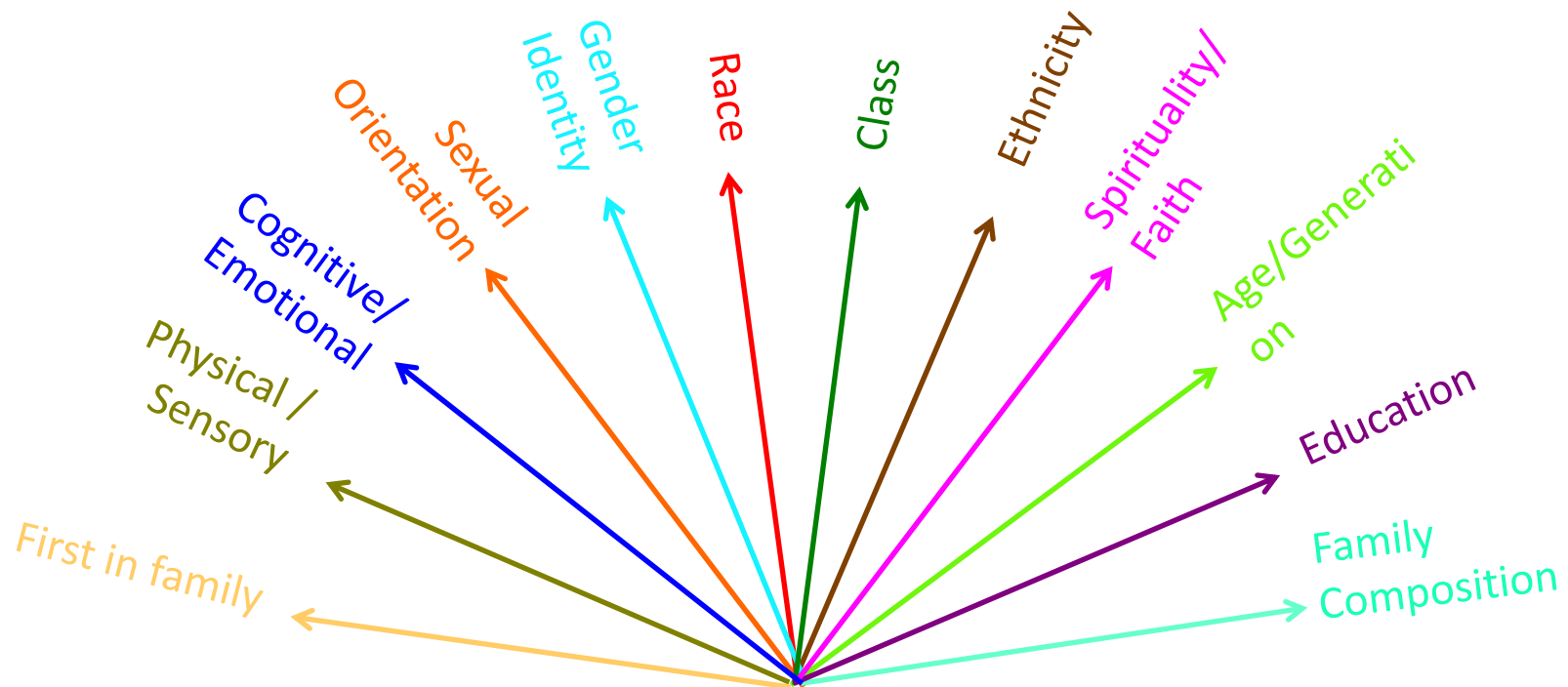


Credit. NYTimes 3/5/2017. With artist's permission. Lynn Z. lynnie.zulu@gmail.com

What to talk about for **2 minutes**?

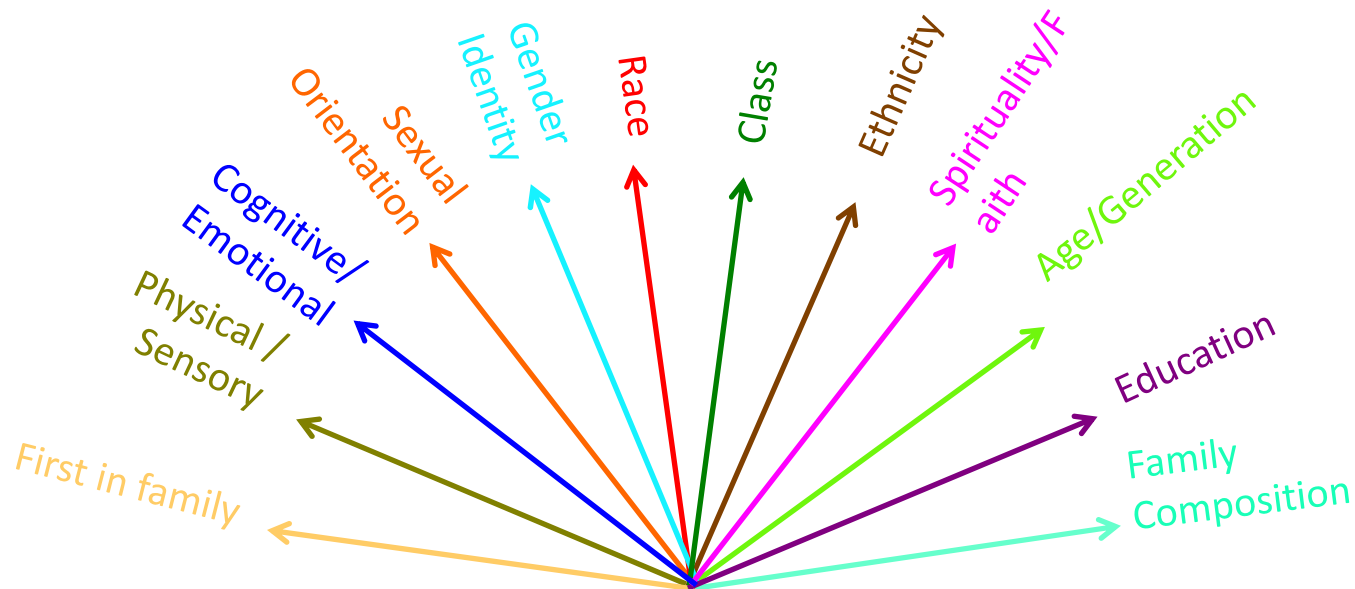
Social identity

- What are **1 or 2** aspects of your social identity that are important to you? **Why** are they important to you?



What to talk about for 2 minutes?

- Personal** Home? Family? Schools? Favorite Subjects?
- Professional** Research area? Challenges? Career pathways? Goals?
- Passion** What are you passionate about?
- Social identity** 1-2 dimensions important to you & Why



Shared Reflections

What did you observe about this experience...

Sharing your identity

Learning about your partner's identity



Credit. NYTimes 3/5/2017. With artist's permission. Lynn Z. lynnie.zulu@gmail.com

Cultural Humility

- **Lifelong learning & critical self-reflection** — to practice cultural humility is to understand that culture is, first and foremost, an expression of self and that the process of learning about each individuals' culture is a lifelong endeavor, because no two individuals are the same. Each individual is a complicated, multi-dimensional human being who can rightfully proclaim *“My identity is rooted in my history... and I get to say who I am.”*
- **Recognizing and challenging power imbalances** — while working to establish and maintain respect is essential in all healthy and productive relationships, the root of effective professional practice is in acknowledging and challenging the power imbalances inherent in our practitioner/administrative – client/student/family dynamics. It is awakening to the power one has as a doctor, a teacher, a police officer, a boss, etc.
- **Institutional accountability** — organizations need to model these principles as well. Does the institutional ethos support inclusion and respectful, substantive discussion of the implications of difference?

Sources: <https://thesocialworkpractitioner.com/2013/08/19/cultural-humility-part-i-what-is-cultural-humility/>, http://melanietervalon.com/wp-content/uploads/2013/08/CulturalHumility_Tervalon-and-Murray-Garcia-Article.pdf,
http://www.acphd.org/media/133120/modii_slides_cultural_competency.pdf



Cultural Humility

O: What words or phrases stand out to you in this handout?

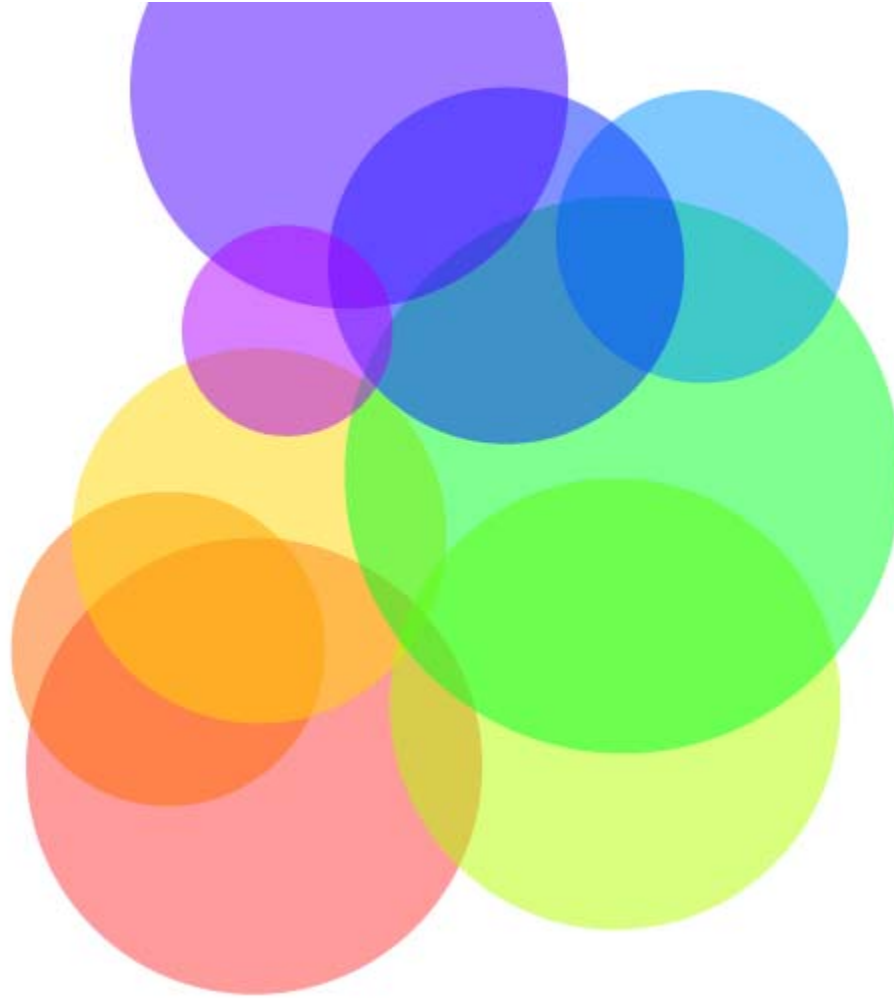
R: What events or stories come to mind as you think about these ideas?

I: How do these ideas relate to how you work with your colleagues and communities?

References

- Banaji, Mahzarin and A. Greenwald. *Blindspot: Hidden Biases of Good People*, 2013.
 - Project Implicit at <https://implicit.harvard.edu/implicit/>. On-line tests to reveal implicit associations and hidden biases.
- Chatman, Liesl. “The Geography of Identity”, NSF INCLUDES CoExIST Conference, March 2017.
- Dweck, Carol. *Mindset: The Psychology of Success*, 2006.
- Frey, William. *Diversity Explosion: The cultural generation gap mapped*, 2014.
 - Interactive data visualizations at http://bit.ly/diversity_explosion
- Hunt, Vivian and L. Yee, S. Prince, S. Dixon-Fyle “Delivering through Diversity”, 1/2018. McKinsey & Co. http://bit.ly/mckinsey_diversity_2018
- Kahneman, Daniel. *Thinking Fast and Slow*, 2011
- MentorNet. A virtual mentoring program open to all STEM students enrolled at accredited institutions of higher education in the U.S. <http://mentornet.org>
- Moretti, Enrico, *The New Geography of Jobs*, 2012.
- National Science Foundation. “NSF Women, Minorities, and Persons with Disabilities in Science and Engineering” Report. <https://www.nsf.gov/statistics/2017/nsf17310/>. (2010 data depicted in this presentation)
- Putnam, Robert. *Our Kids: The American Dream in Crisis*. 2015.
- Shaw, Haydn. *Sticking Points: How to get 4 Generations Working Together in 12 Places They Come Apart*. 2013.
- Yoshino, Kenji. *Covering: The Hidden Assault on Our Civil Rights*. 2006.
 - With Christie Smith. “Uncovering Talent: A new model of inclusion”. Accessible summary of book at http://bit.ly/uncovering_talent.
- Z, Lizzie. Image credit. NY Times, Sunday Review. 3/5/2017. Used with artist’s permission.

Questions and Discussion



V. Vanessa Morris



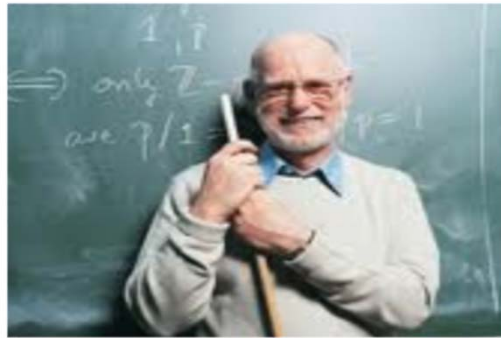
ADDRESSING GENDER & RACIAL INEQUITIES IN STEM

V. VANESSA MORRIS

PA STEM GIRLS COLLABORATIVE PROJCT LEADERSHIP TEAM

MARINE ADVANCED TECHNOLOGY EDUCATION (MATE) PA REGIONAL
COORDINATOR

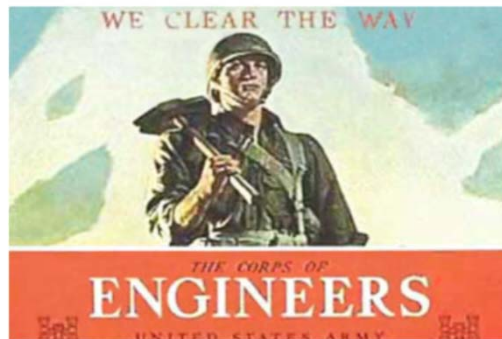
SME, CH. 15, OFFICER



Mathematician



Scientist



Engineer



Technology Specialist

NASA MISSION CONTROL 1960s



Spencer A
The University of Connecticut
Storrs, Connecticut

Dear Miss Kelly:

This is in response to your letter of
February 20, 1962.

Your offer to go on a space mission is
commendable, and we are very grateful.

This is to advise that we have no existing
program concerning women astronauts nor do we
contemplate any such plan.

We appreciate your interest and support
of the nation's space program.

Sincerely,

DR Royal Jr

HOW MANY MORE FEMALE ROLE MODELS ARE STILL HIDDEN?



Katherine Johnson



Mary Jackson



Dorothy Vaughan



1892-1916
ALICE BALL
CHEMIST



UNIVERSITY OF HAWAII'S 1ST GRADUATE STUDENT, BLACK STUDENT, AND THEIR 1ST BLACK WOMAN TO RECEIVE A MASTERS DEGREE. SHE WAS ALSO THEIR 1ST BLACK CHEMISTRY PROFESSOR.

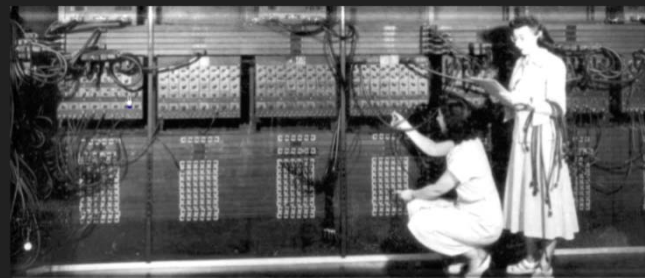
INVENTED THE FIRST WATER SOLUBLE INJECTABLE TREATMENT FOR LEPROSY AT 24, THOUGH NOT A CURE, THE TREATMENT WAS A MAJOR BREAKTHROUGH FOR A PREVIOUSLY HOPELESS DISEASE.

SHE DIED BEFORE SHE COULD SEE HER WORK IN USE. ANOTHER CHEMIST PUBLISHED HER PAPER WITHOUT GIVING HER CREDIT AND NAMED THE TECHNIQUE AFTER HIMSELF. HE RECEIVED CREDIT FOR DECADES UNTIL DR. HARRY HOLLMANN SET THE RECORD STRAIGHT AND RENAMED IT THE BALL METHOD.

THE BALL METHOD WAS USED REGULARLY UNTIL THE DEVELOPMENT OF ANTIBIOTICS IN THE 40'S. IN 1999 THE TREATMENT WAS CITED AS STILL BEING USED IN REMOTE AREAS.


BEFORE HER TREATMENT, AMERICANS WITH LEPROSY WERE FORCIBLY REMOVED FROM THEIR HOMES AND HELD INDEFINITELY IN REMOTE COLONIES. HER WORK ALLOWED HUNDREDS OF PEOPLE WITH LEPROSY TO BE ALLOWED TO RETURN TO THEIR HOMES.

AUBERGDESIGNS.COM



The first coders were women

1890-1980
EUPHEMIA LOFTON HAYNES
MATHEMATICIAN



WAS THE FIRST AFRICAN AMERICAN WOMAN TO RECEIVE A PH.D. IN MATHEMATICS. AS THE FIRST WOMAN TO CHAIR THE DISTRICT OF COLUMBIA SCHOOL BOARD, SHE PLAYED A PIVOTAL ROLE IN THE INTEGRATION OF THE D.C. SCHOOL SYSTEM.

AUBERGDESIGNS.COM

1896 - 1980
MAY EDWARD CHINN
PHYSICIAN



PIONEERING BLACK AND NATIVE AMERICAN DOCTOR AND ADVOCATE FOR EARLY CANCER SCREENING IN LOW-INCOME COMMUNITIES.

1ST BLACK WOMAN TO GRADUATE FROM BELLEVUE MEDICAL COLLEGE.

WAS THE 1ST BLACK WOMAN TO HOLD AN INTERNSHIP AT HARLEM HOSPITAL WHERE SHE WAS THE 1ST WOMAN TO RIDE WITH THE AMBULANCE CREW.

BLACKS WERE BARRED FROM FORMAL ASSOCIATION WITH HOSPITALS, SO SHE OPENED HER OWN PRACTICE AND SHE TREATED PATIENTS WHO DIDN'T HAVE ACCESS TO MEDICAL CARE.

WAS SERIOUSLY CONSIDERED FOR A RESEARCH FELLOWSHIP AT THE ROCKEFELLER INSTITUTE UNTIL THEY DISCOVERED THAT SHE WAS BLACK.

WAS REFUSED RESEARCH INFORMATION FROM HOSPITALS, SO SHE ACCOMPANIED HER PATIENTS TO CLINIC APPOINTMENTS TO LEARN ABOUT BIOPSY TECHNIQUES.

HER WORK WITH THE STRANG CLINIC HELPED DEVELOP THE PAP SMEAR, WHICH TESTED FOR CERVICAL CANCER.

STARTED A SOCIETY TO HELP BLACK WOMEN GO TO MED SCHOOL.


AUBERGDESIGNS.COM

Women in science that you should know... and probably don't.

"I didn't succumb to the stereotype that science wasn't for girls."
-Sally Ride

Mary Somerville
Caroline Herschel
Mary Anning
Emily Noether
Henrietta Leavitt
Alice Catherine Evans
Annie Maunier
Dorothy Hodgkin
Lise Meitner
Jocelyn Bell Burnell
Mildred Dresselhaus
Rosalind Franklin

DR MILDRED DRESSELHAUS
PHYSICIST



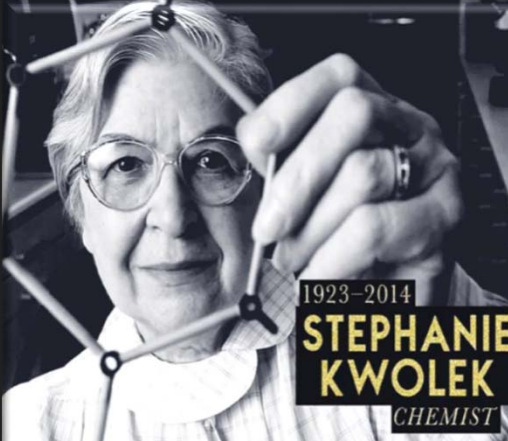
+ Director of the Center for Material Science and Engineering at MIT, 1980s.

+ President of the American Society of Physics, 1983

+ Pioneer of Nanotechnology & Nanoengineering

+ National Medal of Science 1990 & International L'Oréal-UNESCO Award 1997

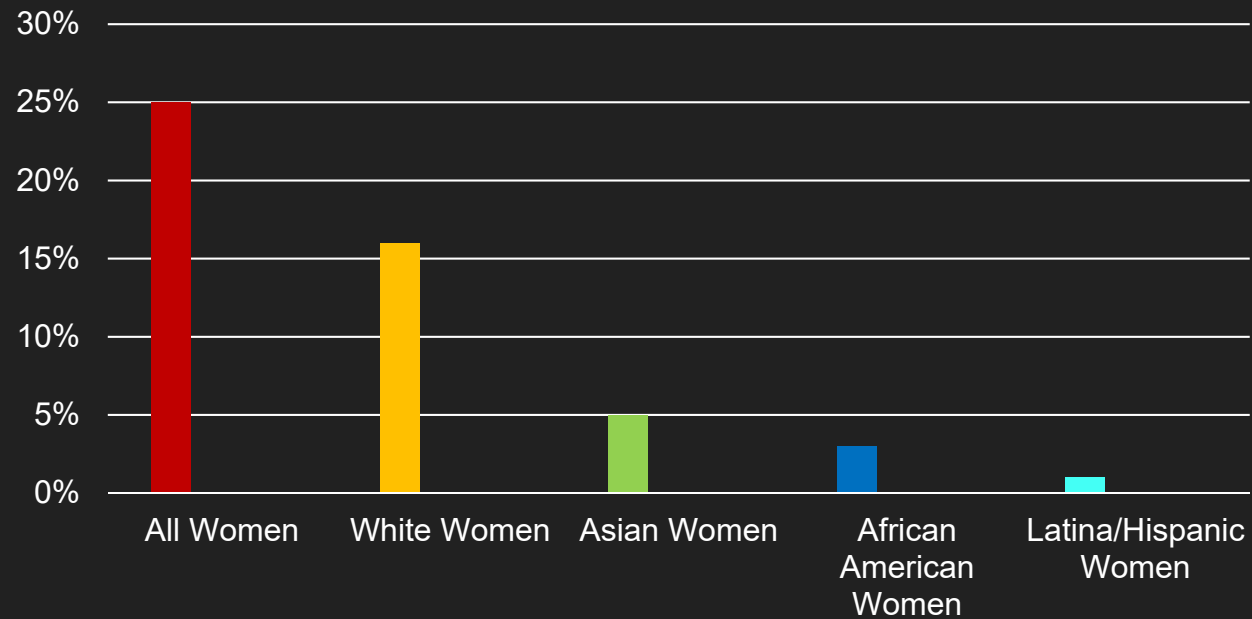
1923-2014
STEPHANIE KWOLEK
CHEMIST



INVENTED KEVLAR, A HEAT-RESISTANT SYNTHETIC THAT'S FIVE TIMES STRONGER THAN STEEL AND LIGHTER THAN FIBERGLASS. IT'S USED IN BULLETPROOF VESTS, FIRE-RESISTANT MATTRESSES, SPACECRAFTS, AND PROTECTIVE GLOVES.

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PERCENTAGE OF COMPUTING OCCUPATIONS HELD BY WOMEN

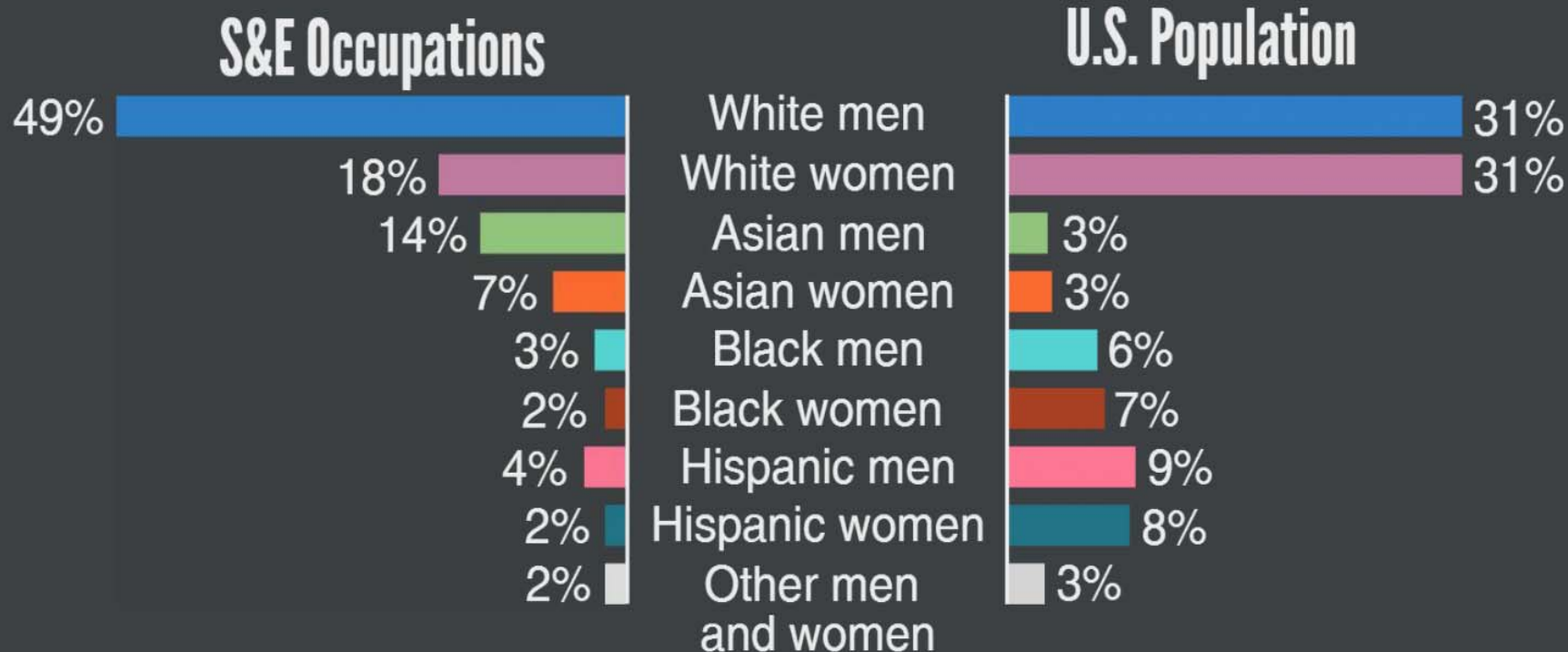


NCWIT (Bureau of Labor, 2016).
NCWIT (Bureau of Labor, 2016).

■ 2015

Workers in science and engineering occupations

In 2015, women and some minority groups were represented less in science and engineering (S&E) occupations than they were in the U.S. general population.



Source: National Center for Science and Engineering Statistics, National Science Foundation
Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017
<https://nsf.gov/statistics/wmpd/>

Who leaves STEM?

STEM Ph.D. Holders in Non-STEM Careers



STEM Ph.D. holders leaves STEM



Female STEM Ph.D. holders leaves STEM

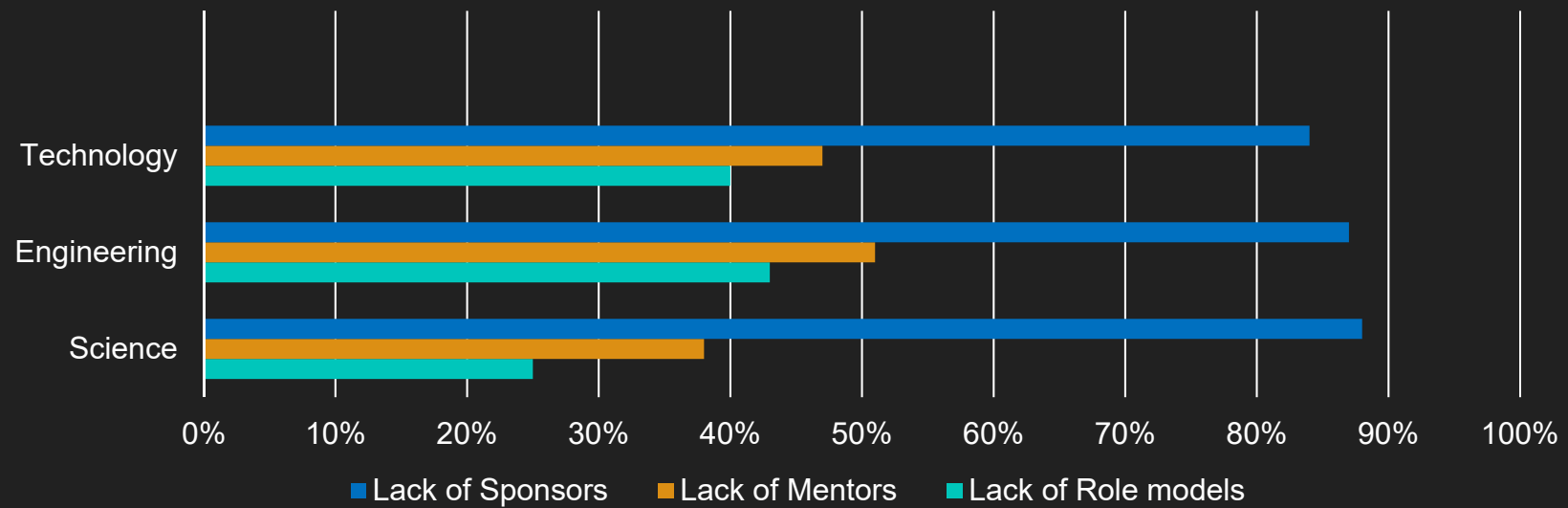


Black STEM Ph.D. holders leaves STEM

Source: American Institutes for Research | www.air.org

<https://www.air.org/resource/leaving-stem-stem-ph-d-holders-non-stem-careers>

WOMEN LACK ROLE MODELS MENTORS & SPONSORS



(Hewlett et al., 2014)

NASA MISSION CONTROL CENTER 2014



QUESTIONS ONLY YOU CAN ANSWER

**Can you name the last female in STEM
you learned about?**

**What do you do to encourage underrepresented
students in STEM?**

**If a young women has a passion for a
career in STEM, what are the resources that support
them?**

Change starts with you!



References

- **Advancing Equity and Empowerment in Science, Technology, Engineering, and Mathematics (STEM)** SEPTEMBER 15, 2015 AT 6:09 PM ET BY JO HANDELSMAN AND DANIELLE CARNIVAL
- **Crenshaw K. (2016) The Urgency of Intersectionality TED talk.**
https://www.ted.com/talks/kimberle_crenshaw_the_urgency_of_intersectionality
(accessed 9/4/2017)
- <https://obamawhitehouse.archives.gov/blog/2015/09/15/advancing-equity-and-empowerment-science-technology-engineering-and-mathematics-stem>
- <http://www.esa.doc.gov/sites/default/files/women-in-stem-2017-update.pdf>
- <https://news.yale.edu/2017/09/18/americans-vastly-overestimate-progress-toward-racial-economic-equality>
- https://www.washingtonpost.com/news/fact-checker/wp/2015/11/30/hillary-clintons-often-told-story-that-nasa-rejected-her-childhood-dream-of-becoming-a-female-astronaut/?utm_term=.0ae4ff5dd304

References

- JSC2014-E-077199 (12 Aug. 2014) --- Expedition 40 flight controllers are seen at work in this overall view of the space station flight control room (FCR-1) during docking of the "Georges Lemaitre" Automated Transfer Vehicle-5 to the International Space Station in Earth orbit. <https://www.nasa.gov/content/houston-mission-control-team-at-work-for-atv-5-docking-to-station>
- Morris, V.R., and Washington, T.M. (2017) The Role of Professional Societies in STEM Diversity. Journal of the National Technical Association, 87(1), 22-31. ISBN-978-0-9993666-0-8
- National Science Foundation. (2017) Women, Minorities, and Persons with Disabilities in Science and Engineering 2017. <https://www.nsf.gov/statistics/2017/nsf17310/static/downloads/nsf17310-digest.pdf> (accessed 9/4/2017)
- National Alliance for Partnerships in Equity. 2013. "PIPE-STEM." <http://www.napequity.org/professional-development/curriculum-tools/program-improvement-process-equity>

References

- NASA Had Zero Plans to Send Women Into Space.
<http://www.businessinsider.com/nasas-rejection-letter-to-women-in-the-60s-2013-7>
- “The Double Bind: The Price of Being a Minority Woman in Science.” American Association for the Advancement of Science.; Association for Women in Science. 2016. “Broadening Participation in Science, Technology, Engineering, and Mathematics.” Open Science.; UNESCO. 2017
- **Women and Men in STEM Often at Odds Over Workplace Equity.**
<http://www.pewsocialtrends.org/2018/01/09/women-and-men-in-stem-often-at-odds-over-workplace-equity/>
- Women in STEM: 2017 Update - <http://www.esa.doc.gov/sites/default/files/women-in-stem-2017-update.pdf>

Questions and Discussion



National Women's History Month

My Steps to STEM: The Stories Behind Inspiring Women in STEM

Goal: To elevate the very real stories of struggle and success that inspiring women in STEM face on their career paths, to inspire more girls to persevere through the challenges of STEM education for rewarding and potentially high-profile careers.

#MySteps2STEM



National Women's History Month

Theme: My Steps to STEM: The Stories Behind Inspiring Women in STEM

1. Feature one high-profile woman in STEM per week by guest-written or NGCP authored blog post and via social media. Each woman will select a program to promote.
2. Host a webinar for 1-2 prominent women to discuss their stories in STEM.
3. Host a Twitter Chat.

We are seeking four women to feature who are:

- inspirational leaders
- demonstrated a commitment to helping other women or girls in STEM
- have a personal story of overcoming obstacles and are willing to share
- actively working in STEM

Together represent the diversity of women in STEM and STEM careers



Next Meeting



Next Collaborative Leadership Teams Meeting
March 14, 2018
National Women's History Month

