Discussion Norms for “Anti-Racist STEM Education”:

- Move Up/Move Back: balance your listening and talking.
- Use evidence (data, experience, etc.) to support your claims.
- Speak personally. What’s true for you depends on you.
- We’re wired to flee discomfort, but discomfort is cool.
- Your intentions may equal your impact. Own your impact.
- We must make sure everyone feels safe. Safe ≠ comfortable.
- What’s said (and by who) stays, what’s learned can leave
- We’re all in this together.
But is that enough?
Strength in diversity

Richard B. Freeman and Wei Huang reflect on a link between a team’s ethnic mix and highly cited papers.

Sticking with co-authors with similar ethnic backgrounds might detract from the impact of your work. The reason is unclear, but bibliometrics suggest that teams with greater ethnic diversity generate papers that make more of an impact in the scientific literature.

We analyzed 2.5 million research papers in which all the authors were affiliated and we found that US-based authors with English surnames were more likely than co-authors with Chinese surnames to have co-authors with Chinese surnames. This trend held for many other groups, including Russian and German populations, between 1985 and 2008. In 15 scientific fields, including biomedicine, physics, and geosciences, the results lead to the conclusion that scientific research in the social sciences is based on similar ethnic backgrounds, a tendency that some societies call homophily.

Stuck in the mind that scientists can persist on a subject for ethnicity, homophily in scientific collaborations also seems to be related to a web of connections in the scientific community. After controlling for the number of authors and factors such as ethnic group and population density, we find that greater ethnic homogeneity among authors is associated with a paper’s publication in high-impact journals. It also predicts a broader citation pattern, four or five authors of a single publication. However, this does not mean that all authors are from the same ethnic group.

Network effects. The impact of the finding that homophily in scientific collaborations may benefit from a greater variety of perspectives. Researchers have been shown to think differently when they work in diverse groups because they expect greater challenges to their ideas, or because small group dynamics are at work. Given that communication can be hampered by linguistic or cultural differences, perhaps homophily and diversity can complement each other.
Our Students Learn that STEM...

• Is objective and unrelated to social influences
• Always helps to improve society
• History of science = a bunch of “dead white dudes”
• Is done today almost entirely by white, male, heterosexual, able...
• Practitioners do not (should not) care about impact of their work

And Rarely That STEM...

• Is a “human endeavor”, done by (imperfect) humans
• Advances often come with a cost
• History of science is rich, multi-ethnic and global
• Is done today by a diverse group of people
• Has a history full of activists and compassionate practitioners
Small Group Discussion #1

Define:  Racist
         Non-racist
         Antiracist

Discuss: Differences?
“In a racist society, it is not enough to be non-racist, we must be antiracist.”

- Angela Davis
How do we define Antiracist?
Small Group Discussion #2

Identify examples in STEM education (both teaching and learning) of all three:

Racist - Non-racist - Antiracist
What stops us from being effective antiracist STEM educators?

As individuals?
As a profession?
Small Group Discussion #3

- What personal barriers have kept you from practicing anti-racist STEM education?

- What institutional barriers have kept you from it?
What are we trying?
Examples

Astronomy Perspective: Aztecs

Founded in the fourteenth century, Mexico City has been a center for three great civilizations: the Aztecs, the Spanish, and the modern-day Mexicans. When the Aztecs first settled the area, it was largely covered by an enormous lake, Lake Tenochtitlan, which either was filled in or dried out as the city began to grow. Aztec pyramids pictured to the right.

Aztec astronomers had important reasons for sky watching. The Aztecs saw in the heavens the sustainer of life—the gods they sought to appease, with the blood of sacrifice, for bringing favorable rains, for keeping the earth from quaking, for spurring them on in battle.

Among the myths were the legends about (Black Tiguaxitlaca pictured left), who rode the night from his able in the north using the Big Dipper as a wheel. He presided over the cosmic ball court (Geminio) where the gods played a game to set the fate of humankind. He is the fire sticks (Citius’s belt) that brought warmth to the hearth. And at the end of every 562-year calendrical cycle, Black Tiguaxitlaca timed the rattlesnake’s tail (the Pleiades) so that it passed overhead at midnight—a guarantee that the world would not come to an end but that humanity would be granted another epoch of life.

Printers in Tuzcallitlana often climbed to the top of their sky temple on the Hill of the Sun to look for auspicious signs from Black Tiguaxitlaca. They believed that everything on earth was the outcome of destiny. And they recorded everything in their books.

Created in the late Fifteenth century, the Codex Borgia, a seventy-six-page document of

Sample Presentation:

History of Astronomy - Wakanda

By Blah and Biah
Cultures of Constellations

Stellar constellations as viewed through the lens of different cultures.

- European, Arabian, Chinese, Aztecs
Looking at Science Itself

2014 Population (Age 25-64)

- White: 64.1%
- Black: 12.5%
- Hispanic/Latinx: 15.5%
- American Indian or Alaska Native: 0.7%
- Native Hawaiian/Pac Island: 0.2%
- ≥2 Races: 1.4%

2017 Physicists (and Astronomers)

- White: 59.2%
- Black: 32.7%
- Hispanic/Latinx: 4.1%
- American Indian or Alaska Native: 8.0%
- Native Hawaiian/Pac Island: 1.2%
- ≥2 Races: 0.0%
MIT Hunger Strike: Sour Grapes, Or the Bitter Taste of Racism?

James Sherry, one of Massachusetts Institute of Technology's (MIT) Cambridge, began a hunger strike last week to protest the school's denial of his bid for tenure. Claiming that racism played a part in rejection, Sherry vows to maintain a daily presence outside the provost's office until MIT "admits" its bias and grants him tenure. Sherry is the only African American on the at-large faculty at the nation's elite research institution.

Sherry, an associate professor, would have been the first African American in the university's biological engineering department - a campus where 4% of professors and 5% of the student body are black. He claimed that his rejection was based on his research and teaching abilities. He is now suing MIT for $2.5 million.

The school, however, contends that the tenure decision was based on academic reasons.

The count at the time was 38 to 1. MIT officials have named the matter in contention with Sherry's allegations. "This is definitely the most serious issue I've dealt with," says associate provost Claude Caramanis, who led a committee tasked with the issue. "We've never had a similar problem before.

Public protest: James Sherry begins his 24-hour hunger strike outside the provost's office before sounding its alarm in the afternoon.

Three-person committee to reconsider the tenure review. "But there was no evidence to support the view of the students," Sherry told Time magazine. "There was no evidence to support the view of the students," Sherry told Time magazine. "There was no evidence to support the view of the students," Sherry told Time magazine.

Sherry has been a tenured professor at MIT for the past 10 years. He has taught in the school's mechanical engineering department and has also served as an associate dean and as a dean of the college of engineering. He was born in Chicago but grew up in Cambridge, Massachusetts. He received his Ph.D. in mechanical engineering from MIT in 1988. Sherry was instrumental in the development of new materials for use in aerospace and automotive industries. His research interests include composite materials, structural analysis, and design optimization. He has published extensively in these areas and has received several awards for his work. Sherry has been involved in the MIT Black Student Union and has been an active member of the MIT community. He is married with two children.
Examples

What Can We Do?

- E-mailing congresspeople what you would like to see changed
- Talk about these things w/ friends and family
- Attend public hearings about relevant issues
- Be aware of your own bias
- Be more open to new cultures (don't judge)
- Pay attention to the problems so you can understand
- Speak out when you hear racist/sexist jokes
- Learn more about other cultures
- Publicize physics' inherent awesomeness (do it well)

Institutionalized Racism

- Increase pay for public school teachers
- How are you going to do this?
- Vote for people who agree with you
- Educate others
- Tell everyone to take Moses' class

Don't act if you don't do anything (apathy)

Increasing awareness about the problem by talking about it with friends and family to share information i.e. at the dinner table.
“There's really no class that would be "better" to talk about it in, and race in physics are intertwined when you look at the statistics.”
The Under-Representation Syllabus Project

Lesson Plans

I. Embarkation: laying the foundation
   A. Learning about Scientists Lives
   B. Data Analysis: Under-Representation
   C. Why Does Representation Matter?

II. Fuelling: gaining relevant knowledge
    A. Meritocracy
    B. Stereotype Threat
    C. Systemic Racism Systemic Sexism
    D. Privilege and Affirmative Action
    E. Political Correctness
    F. Implicit Bias
    G. Intersectionality

III. Ignition: turning knowledge into action
    A. Students are motivated and able to identify actions

Resources

[Article Link: http://underrep.com]

Pre-Lesson Homework

Read this article about James Sherley, a science professor who was denied tenure. He cited
you "Rape" Teacher Notes

1) Throughout this unit, when there's important pre-reading, I have found that I'd rather
   students step out of class (if possible in your school) to do it than stay in discussion
   and pretend. In this case, I invite students who haven't read the Sherley piece to step out
   or to the side to read it and to rejoin the conversation when they are ready.

2) The best examples for "which fit your definition of racism?" are the ones which will
   engage your students and help move them to add systemic forms of racism into their
   definition. This will be different for every group, but I try to use ones that feel really
   relevant: currently In the news, local, charged, etc.

   Lately I'm finding particular traction with disciplinary statistics, residential patterns (you
   can find your own city by using this tool)

3) Students tend to start with a definition of racism that requires individual actors, and
   bad intent by those actors. If nobody votes for an example that illustrates systemic
   racism, I will often step out of Facilitator Mode and share why I (or some people) might
   consider that to be an example of racism. Example: I might highlight how choosing
   only based on GPA might combine with the relative lack of academic opportunities for
   students of color to create an outcome in which hiring based only on GPA will create
   under-representation in the lab. (Though, of course, the alternative is complex as well.)

4) In my unique teaching context - a white man teaching in majority white private school -
   my goal in this conversation is to help students broaden their definition of racism to
   include systemic racism, which many of them have never had to consider. This may be
   very different depending on your context and your identities.

We conclude with two wrap-up activities:

At the end of this unit, you can consider that this might also be an example of racism.

Rather than debating whether black people can be racist or white people face racism too,
I ask students: "can you see how there are systems that benefit all white people and
harm all people of color?"
What Can You Try?

Identify a group of shared experience with whom you want to discuss.

Approximately 5 per group.
What Can You Try?

Potential Topics:
Curricula
Teacher Practices
Outside the Classroom
Extracurriculars

Process:
Individual PostIts
Large PostIts
Gallery Walk
Gallery Walk
Small Group Discussion #5

What will we gain by doing these things?

Aspirational goal setting
Thank you!

tinyurl.com/2019POCCSTEM

Alyssa Reyes  areyes@universityprep.org
Shayé Witmer  swhitmer@evergreenschool.org
Moses Rifkin  mrifkin@universityprep.org