

# GENDER BIAS IN STEM: ISSUES AND ACTIONS

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WELCOME!

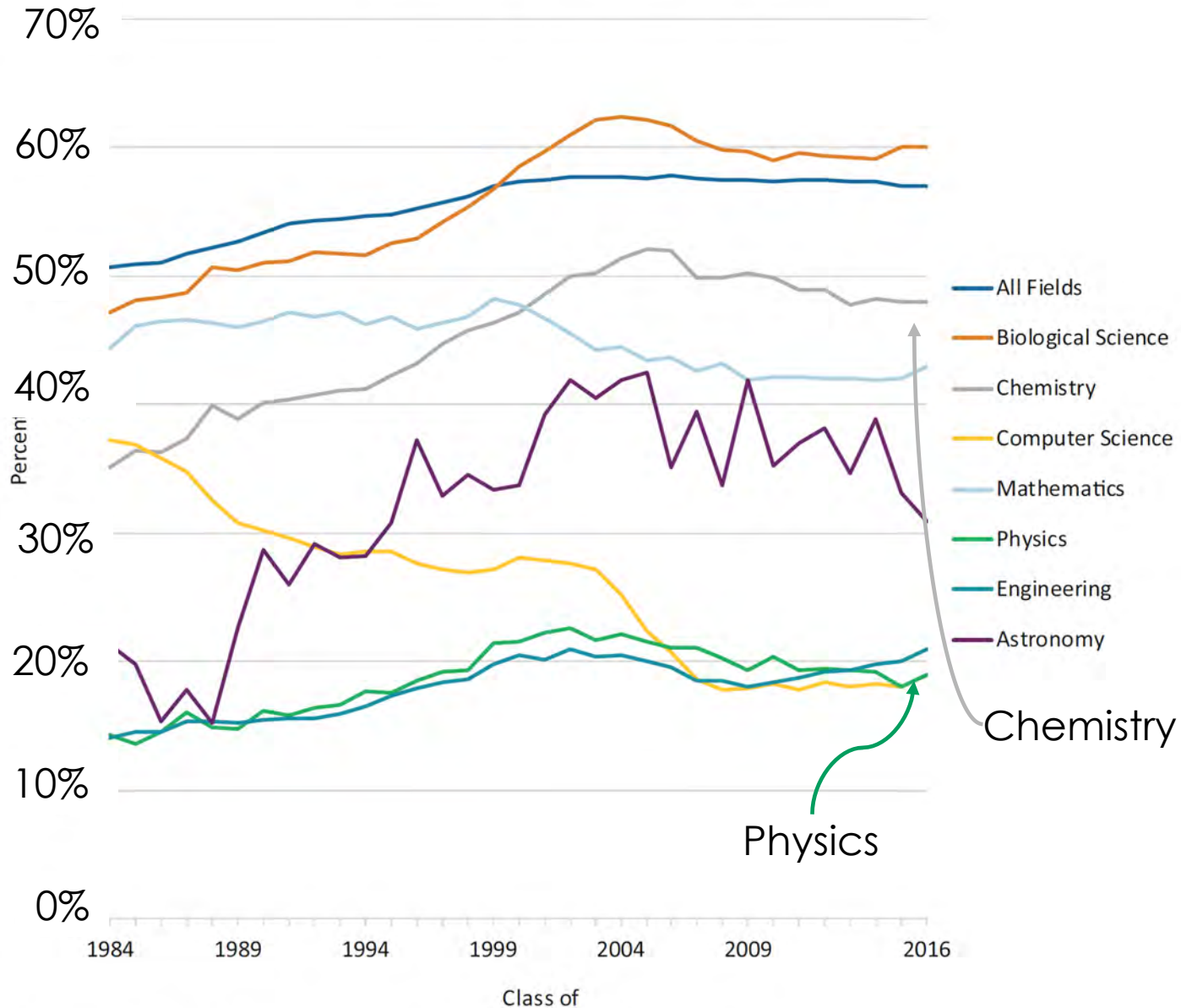
# DISCLAIMERS

- Topic can be uncomfortable
- Learning is uncomfortable!
- Happy to provide sources
- QR code/website on last slide—these slides
- Focus on gender; POC have it worse
- I love this topic = I talk fast!

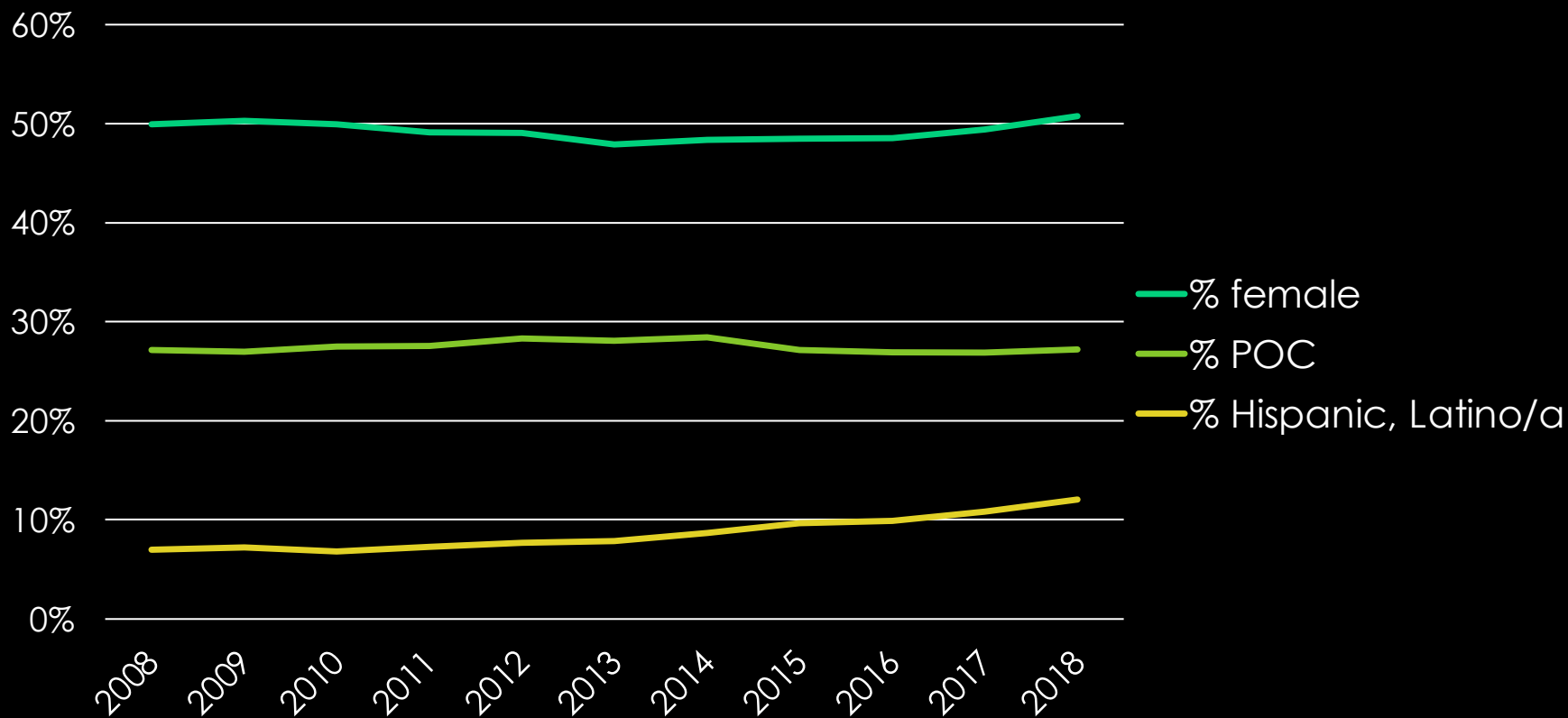


# WHY TALK ABOUT DIVERSITY AND STEM?

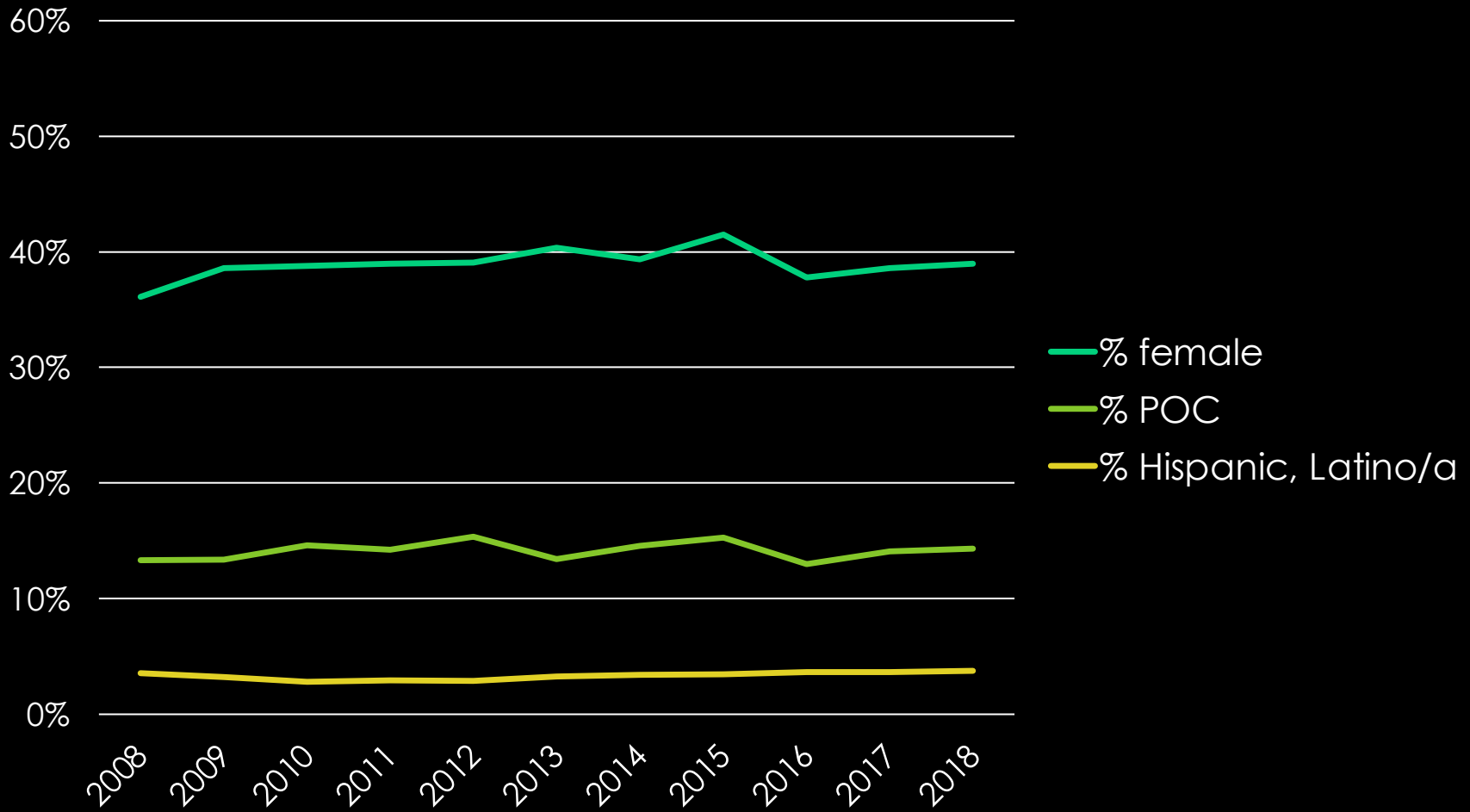
## Percent of Bachelor's Degrees Earned by Women in Selected Fields, Classes of 1981 through 2016



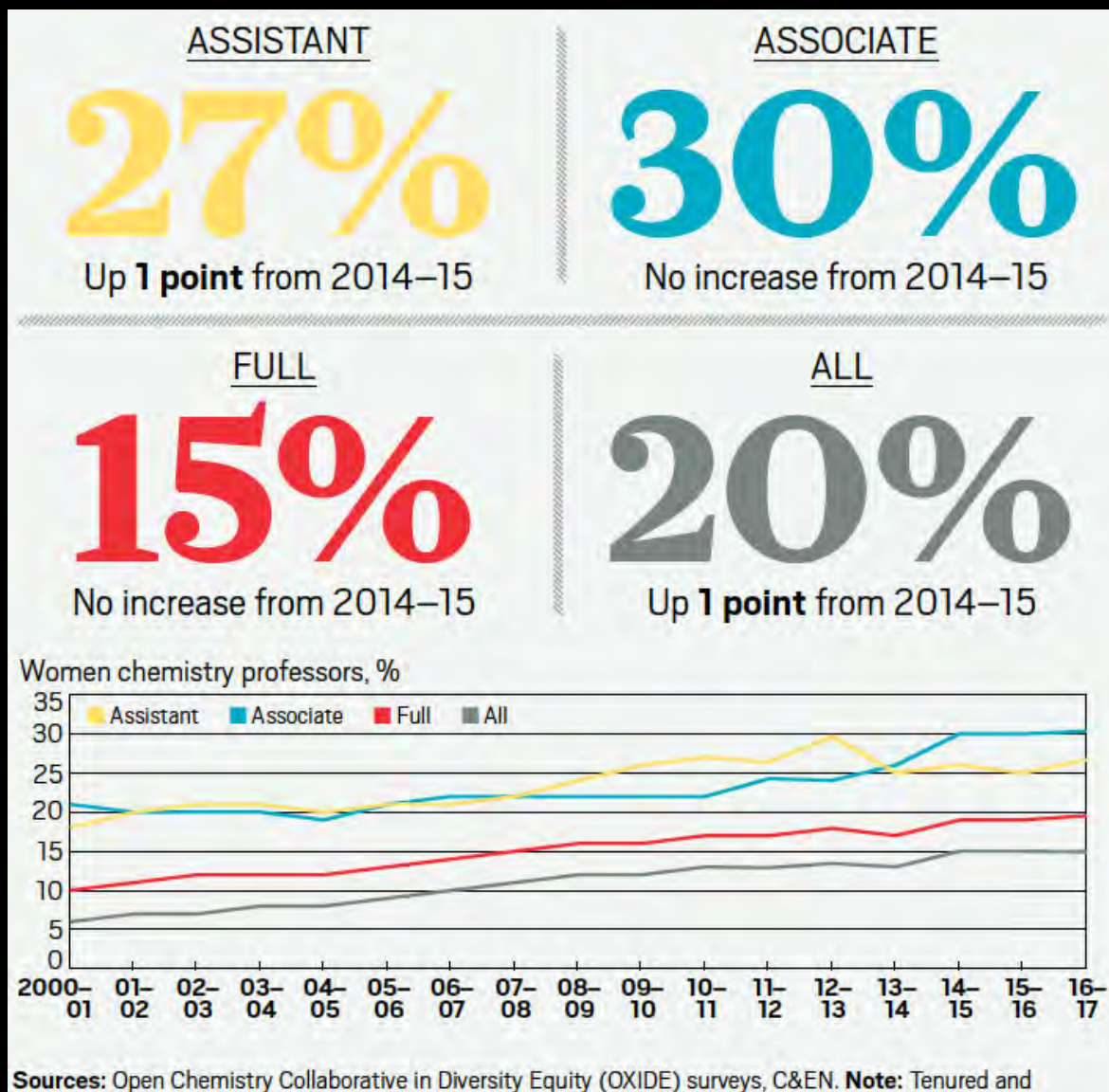
## Chemistry Bachelors Degrees by Year and Population



## Chemistry Doctoral Degrees by Year and Population



# WOMEN FACULTY







OK, SO  
WHAT?



- Waste of talent

- What ideas have been lost?
- How slowly have we made progress?
- How much energy has been diverted from science?
- How much money has been diverted from science?

- Moral issue

- Serious inequity in our culture
- Social justice issue
- Systemic racism, sexism, etc.

# HOW CAN WE CREATE A MORE INCLUSIVE STEM?

- Find out what helps
- Find out what hurts
- Build awareness
- Motivate people
- Offer strategies and actions
- Measure effects



# DEFINITIONS

- EQUALITY

- EQUITY

- JUSTICE

- DIVERSITY

- INCLUSION

- INTERSECTIONALITY

## Equality



The assumption is that everyone benefits from the same supports. This is equal treatment.

## Equity



Everyone gets the supports they need (this is the concept of "affirmative action"), thus producing equity.

## Justice



All 3 can see the game without supports or accommodations because **the cause(s) of the inequity was addressed.** The systemic barrier has been removed.

# DIVERSITY VS. INCLUSION

Diversity is inviting someone to the party. Inclusion is asking them to dance. –Verna Myers



# GENDER AND INTERSECTIONALITY



# THINGS THAT HELP

- Sense of belonging
- Self-identity as a scientist
- Growth mindset
- Talking about the topic (at least in physics...)

--Why Are Some STEM Fields More Gender Balanced Than Others? Cheryan et al. 2017

--A Motivational Account of the Undergraduate Experience in Science, Skinner et al. 2017

--<https://www.psychologytoday.com/us/basics/growth-mindset>

--APS STEP-UP: <https://engage.aps.org/stepup/home>



# THINGS THAT HURT

- Few or no role models\*
- Harassment\*\* (women chemists 10x as likely to experience)
- Stereotype threat\*\*\*
- Fixed mindset\*\*\*
- Microaggressions\*\*\*\*
- Implicit/unconscious bias

\*College Chemistry Textbooks Fail on Gender Representation Becker & Nilsson, 2021

\*\*White S, Ivie R. The Global Survey of Scientists: encountering sexual harassment. Pure & Applied Chemistry. 2021;93(8):831-837. doi:10.1515/pac-2021-0304

\*\*\*[https://www.ted.com/talks/russell\\_mcclain\\_implicit\\_bias\\_stereotype\\_threat\\_and\\_higher\\_education](https://www.ted.com/talks/russell_mcclain_implicit_bias_stereotype_threat_and_higher_education)

\*\*\*\*Gendered Microaggressions in Science, Technology, Engineering, and Mathematics, Yang and Carroll, 2018

# IT'S ALL ABOUT THE BIAS

- Implicit/Unconscious/Unintentional/Unexamined bias
  - Growing up → culturally instilled values
  - Pervasive: everyone has them
  - Separate from explicit biases (can be same or different)
  - May differ from our declared beliefs
  - Tend to favor our own in-group
  - Malleable—thank goodness!

# Implicit (Unconscious) Bias

Growing up → culturally instilled values

Pervasive: everyone has them

Different from explicit biases (can be same or different)

May differ from our declared beliefs

Tend to favor our own in-group

Malleable—thank goodness!



# REDUCING BIAS

- Awareness
- Motivation
- Actions

# ASSUMPTIONS

- Stereotypes and assumptions are mental shortcuts
- Can be very useful
- Can be problematic

Making assumptions...



# Which is closest to your thinking?

He's probably on his  
phone--what a jerk

Distracted driver--stay  
away from him!

Dude really needs to pull  
over

This guy is clearly drunk

None of the above

# CHANGING (OUR LANGUAGE, OUR ASSUMPTIONS)

- Become aware (a student uses they/them pronouns)
- Catch yourself afterwards (Oh no, I called them “she”!)
- Catch yourself beforehand
- Build habit of new words or new behaviors



# REDUCING IMPLICIT BIAS

- Find your own biases (IAT at Harvard)
- Think about your biases
- Seek out counterexamples
- Learn about people to see them as individuals
- Practice empathy
- Set gradeschemes/rubrics/checklists ahead of time
- Give yourself time on decisions

# AUTHENTICITY

- Inclusive environment is one where people bring their true, authentic self
- No need to hide parts of identity
- Do you bring your authentic self to school/work?
- Make differences a positive
- Show your own differences
  - LGBTQ/Pride stickers on laptop
  - Talk about your hidden identities

# CHANGING PERCEPTIONS

## SUPPORTING DIVERSITY IN STEM

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# ALL THE FEELS!

- Emotional topic
- Emotion = Engagement




# PITFALLS/MISCONCEPTIONS

- You can become “woke” and be done
- Depression, anger, frustration without action
- Thinking you are a bad person because of unconscious bias
- Impatience with others
- Assuming (malicious) intent instead of ignorance
- Focus on past mistakes
- Wanting immediate visible changes

# READY, SET, ACTION!

- Think about your daily routine
  - Where are places you are likely to make assumptions?
  - Where are places you are likely to be biased?

- 
- Think about one way you can be more authentic and true to yourself at school/work.

# ALL TOGETHER, NOW

- What is one action your club/study group can take to be more inclusive?
- What is one action to make your classroom more inclusive?
- What is one action to make a process more inclusive (hiring/tenure/performance evaluation)?



# KEEP GOING!

- Set a time to meet with others
- Start a reading group
- Find webinars, TED talks, podcasts, research
- Invite others to help
- Ally groups
- Get administrators involved
  
- Slow steps are progress!

One final thought



“There is always hope.”

THANK YOU!

[Lauramccphd.com](http://Lauramccphd.com)

