

# Welcome!

## NGCP National Webinar: Addressing STEM Stereotypes with Youth and Young Adults

Please respond to the poll on your screen



National Girls  
Collaborative Project





# Addressing STEM Stereotypes with Youth and Young Adults

October 13<sup>th</sup>, 2022



# NGCP Vision

The vision of the National Girls Collaborative Project is to **support and create STEM experiences** that are as **diverse as the world we live in.**





# Our Goals

Connect + Create + Collaborate

1

**Build and sustain a network**  
of advocates to provide equitable  
and inclusive STEM  
opportunities.

2

**Catalyze equity in STEM**  
from research to practice by  
providing actionable knowledge  
that transforms the STEM  
experience.

3

**Increase our collective impact**  
by strengthening organizational  
effectiveness and enhancing our  
fiscal sustainability.

# NGCP Activities

- Network Partnerships
- IF/THEN Collection
- FabFems
- State Leadership Teams



# National Webinars

- Offered monthly on topics to help our networks grow and thrive
- Speakers include educators, researchers, authors, and diverse STEM professionals
- Sign up: <https://www.ngcproject.org/events-announcements>

*"I have gotten more out of this than the dozens of other presentations I have attended this summer."*

*"I found this useful and enjoyable."*

*"I really like all the resources placed in the chat that I can go and flip through to find what is most helpful to my organization"*





# NGCP Newsletter

- National in-person and online events
- STEM resources for engaging girls and youth, professional development opportunities for educators, and opportunities for youth
- Research and reports related to STEM and equity, informal STEM education and learning
- NGCP updates and events, including webinars, knowledge products, and tools





# Addressing STEM Stereotypes

## Part one of a two-part webinar series

- What are stereotypes and why do they matter?
- How do stereotypes impact participation and identification with STEM?
- When do stereotypes begin to impact children and youth?
- What are the strategies and approaches for addressing STEM stereotypes?

**Share in the chat:** What are YOUR experiences with STEM stereotypes? How do they impact you or the youth you serve?





# STEM Stereotypes

- STEM professionals look like this → → → → → → → →
- STEM professionals work alone
- STEM careers do not make a difference in the world
- STEM professionals are all brilliant, naturally gifted at math and science
- STEM careers do not relate to me, my life or my community
- STEM professionals work a lot and do not have lives outside





# Speakers



**Michelle Higgins**  
University of Arizona



**Claudia Fracchiolla**  
American Physical Society (APS)





PHYSICS TOGETHER

# STEP UP: Supporting Teachers to Encourage the Pursuit of Undergraduate Physics for Women

Claudia Fracchiolla, American Physical Society

October, 2022



Learn more at [STEPUPphysics.org](https://STEPUPphysics.org)



# I AM WHO



WOMEN  
IN PHYSICS



¡Sí Podemos  
Venezuela!

VENEZUELAN  
LATINA  
ACTIVIST

SOCIAL  
DISTANCING?  
EASY



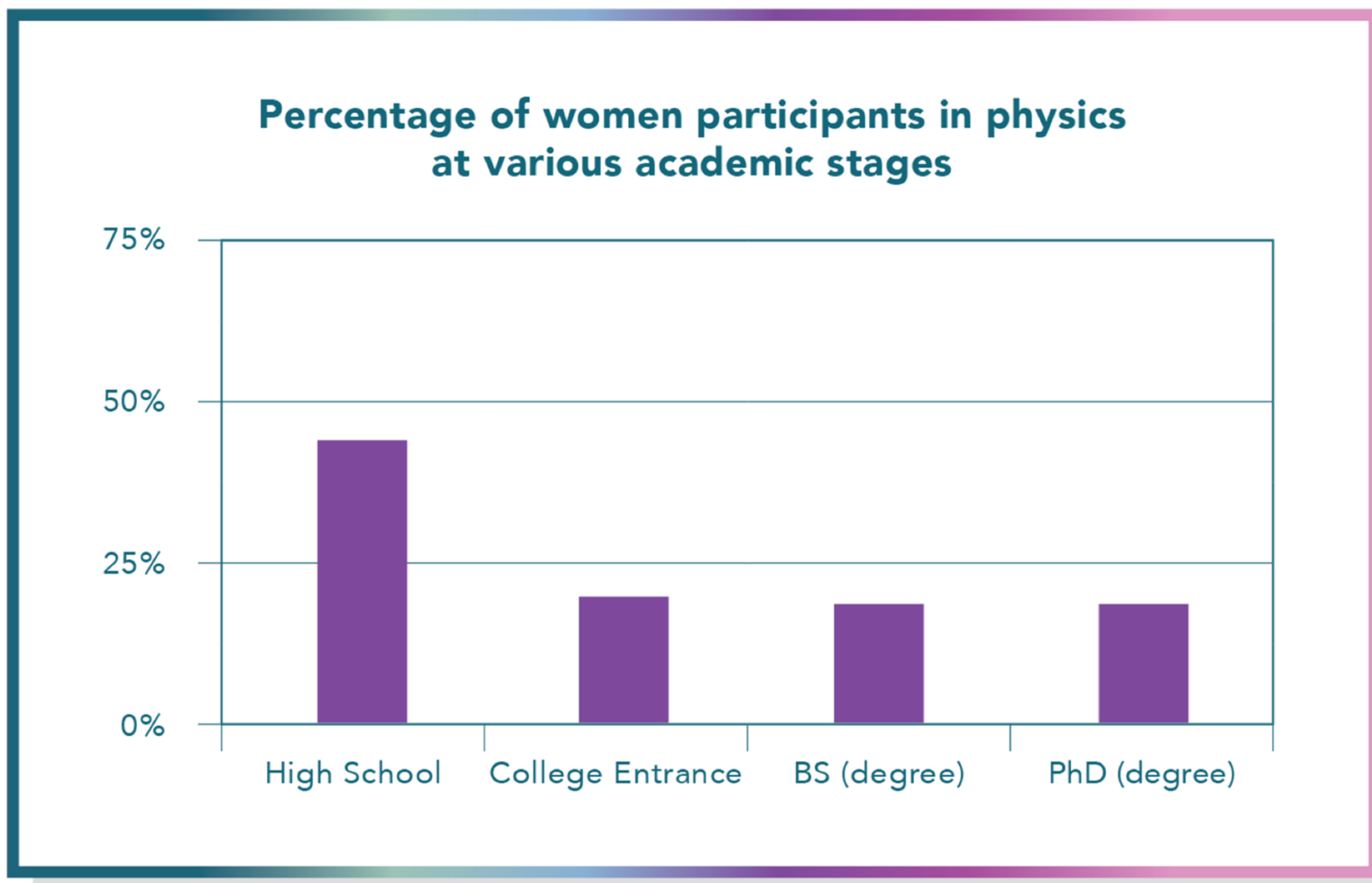
INTROVERT

THIS IS ONLY  
TO SHOW OFF  
I MET  
STAN LEE

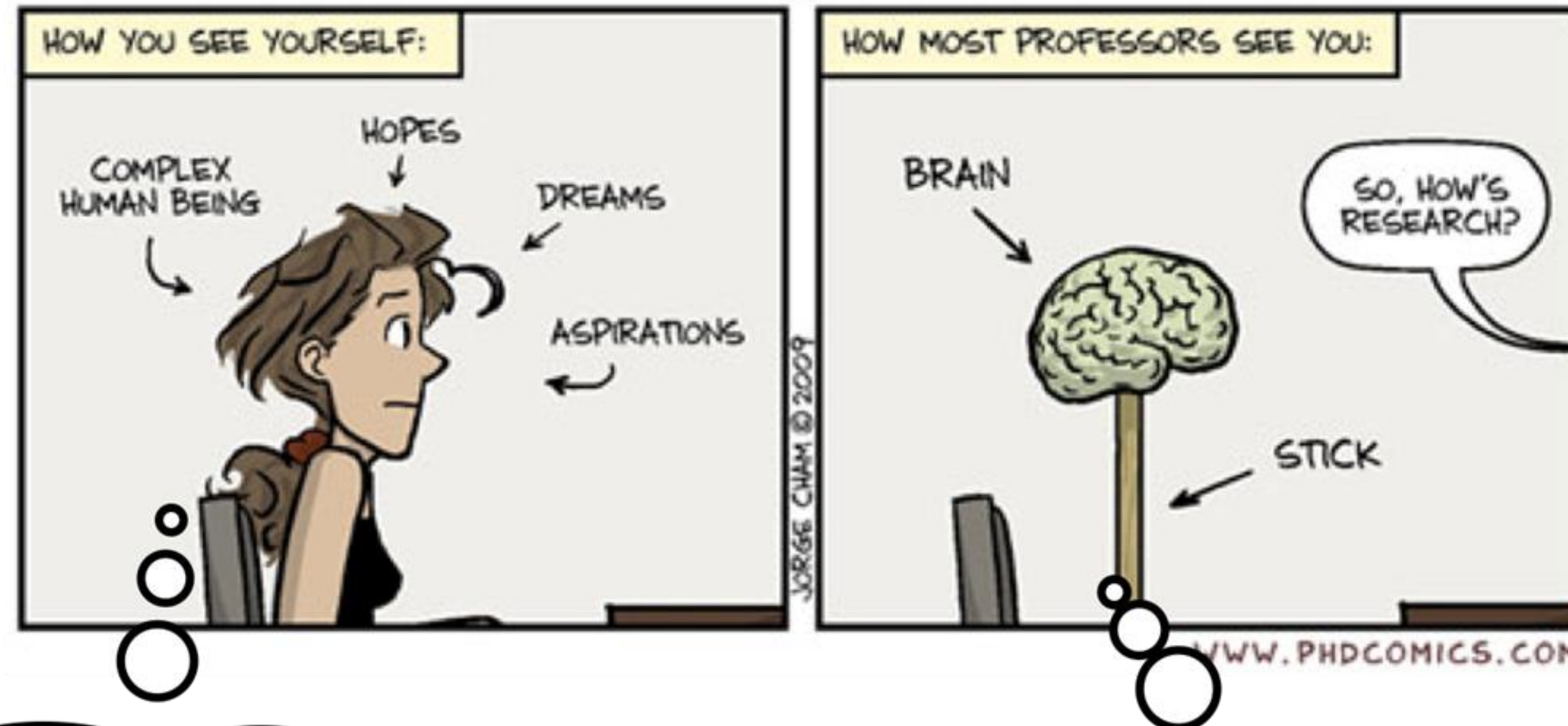
GEEK



# Percentage of Women in Physics



# Discipline-Based Identity



IDENTITY IS DEVELOPED THROUGH  
INTERNALIZATION OF VALUES &  
NORMS SELF-DETERMINATION  
THEORY<sup>5,6</sup>

IDENTITY IS  
CREATED THROUGH PRACTICE AS  
A SOCIAL ENTERPRISE --  
COMMUNITY OF PRACTICE<sup>3,4</sup>

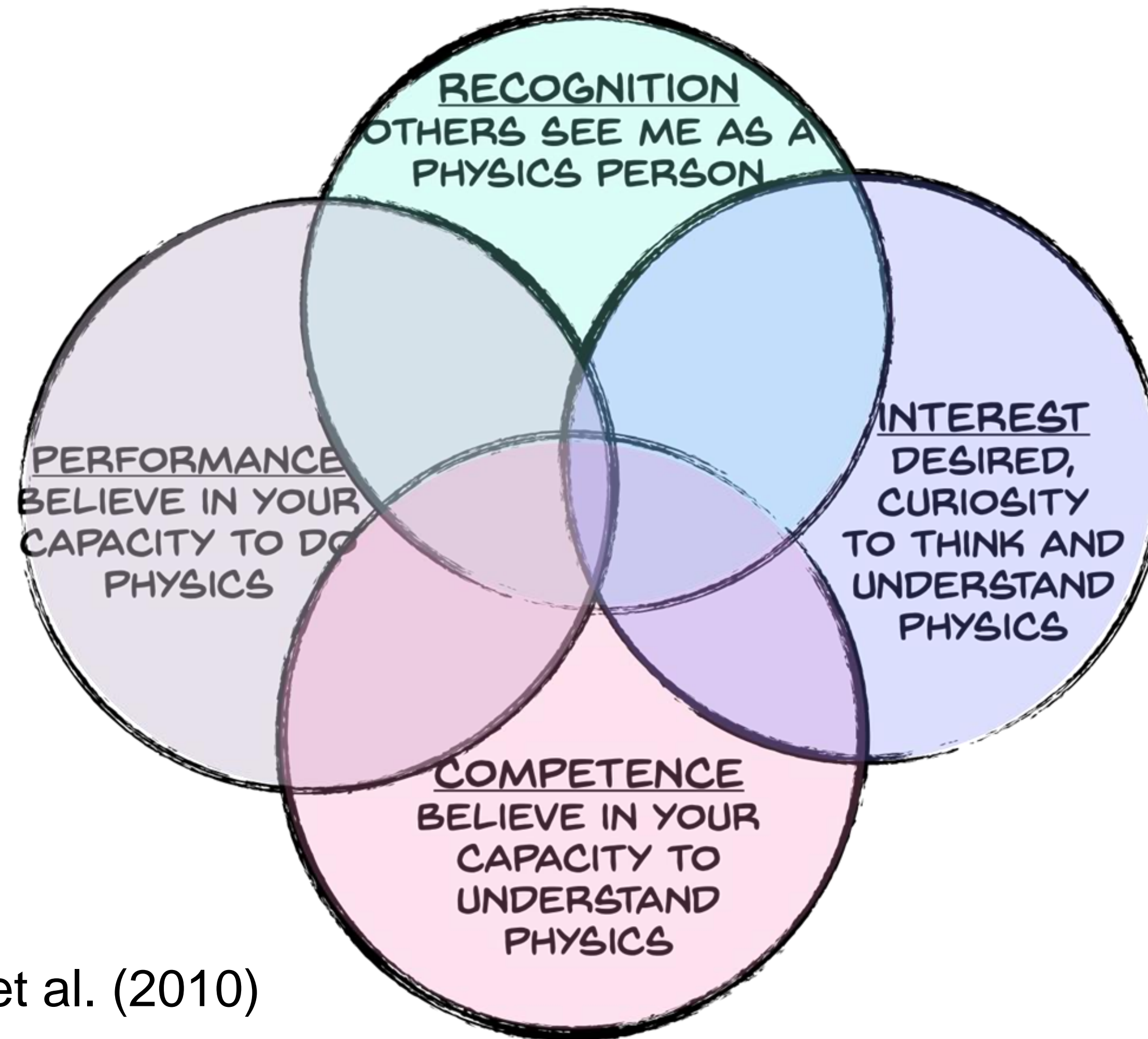


# Physics Identity

Based on Carlone & Johnson [2007]



Zahara Hazari  
Florida International University



**RECOGNITION  
AND  
INTEREST  
ARE SOME OF THE  
MOST  
INFLUENTIAL  
FACTOR FOR  
CHOOSING A  
CAREER IN  
PHYSICS**

Hazari, Z., et al. (2010)



# Critical Physics Identity



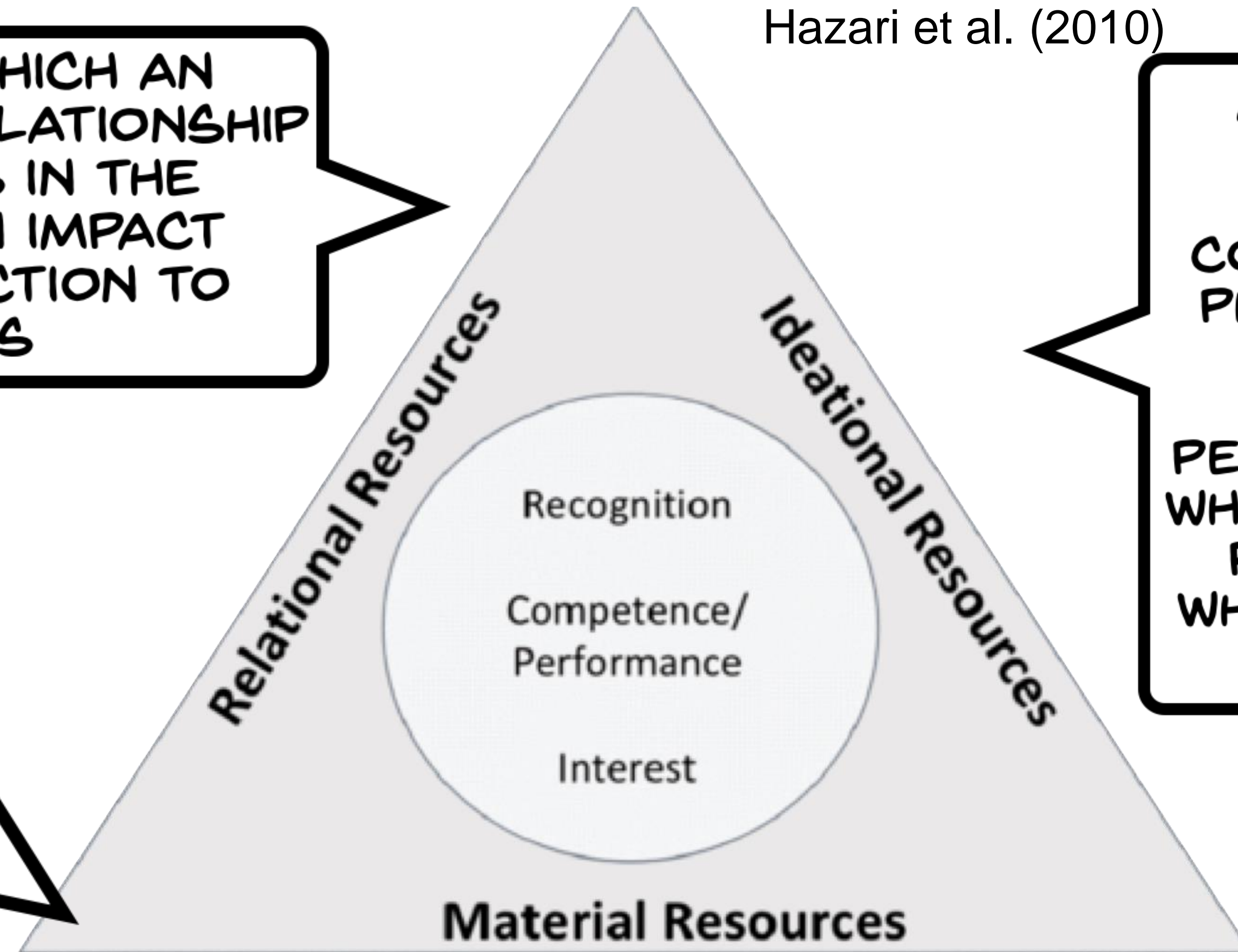
Simone Hyater-Adams  
STEM From Dance

Based on Nasir, N. (2011)  
Hazari et al. (2010)

THE WAY IN WHICH AN ASPECT OF A RELATIONSHIP WITH OTHERS IN THE CONTEXT CAN IMPACT ONE'S CONNECTION TO PHYSICS

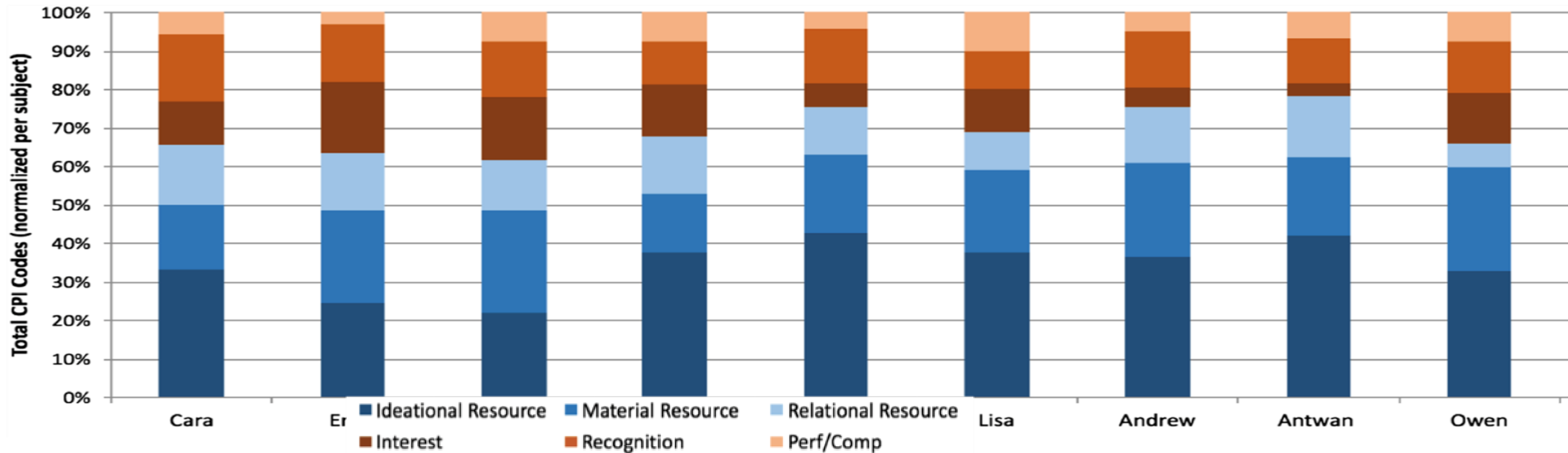
ASPECTS OF IDEAS THAT IMPACT OUR CONNECTION TO PHYSICS, ONE'S PLACE IN PHYSICS, PERCEPTIONS OF WHAT'S VALUED IN PHYSICS AND WHAT PHYSICISTS SHOULD BE

MATERIAL THINGS THAT CAN PROVIDE ACCESS TO OTHER IDENTITY CONSTRUCTS, (I.E. PROGRAMS, COMMUNITIES, ORGANIZATIONS, FUNDING)





# Critical Physics Identity



**OUR RACIALISED IDENTITIES OVERPOWER ANY  
OF OUR OTHER IDENTITIES**

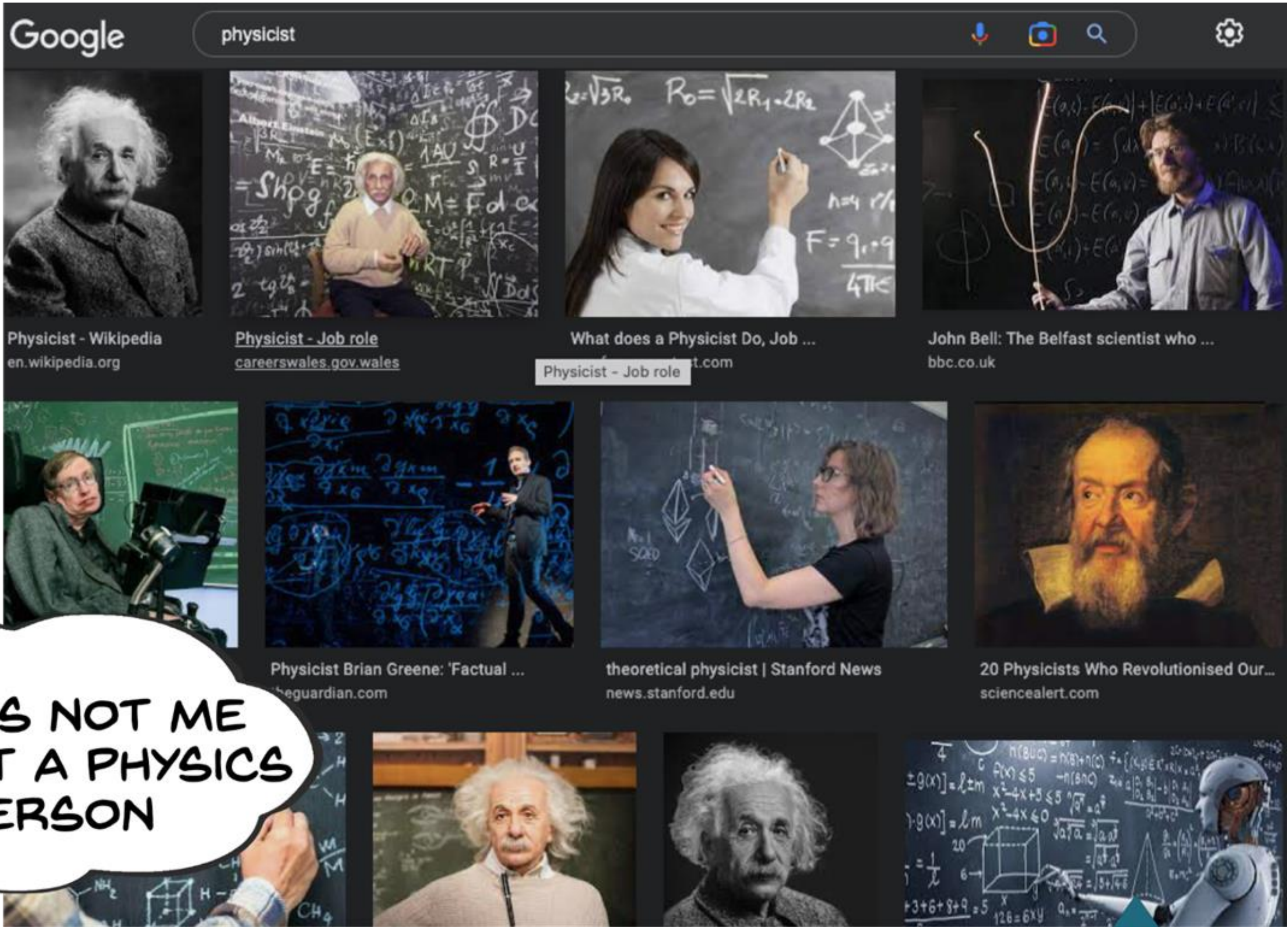
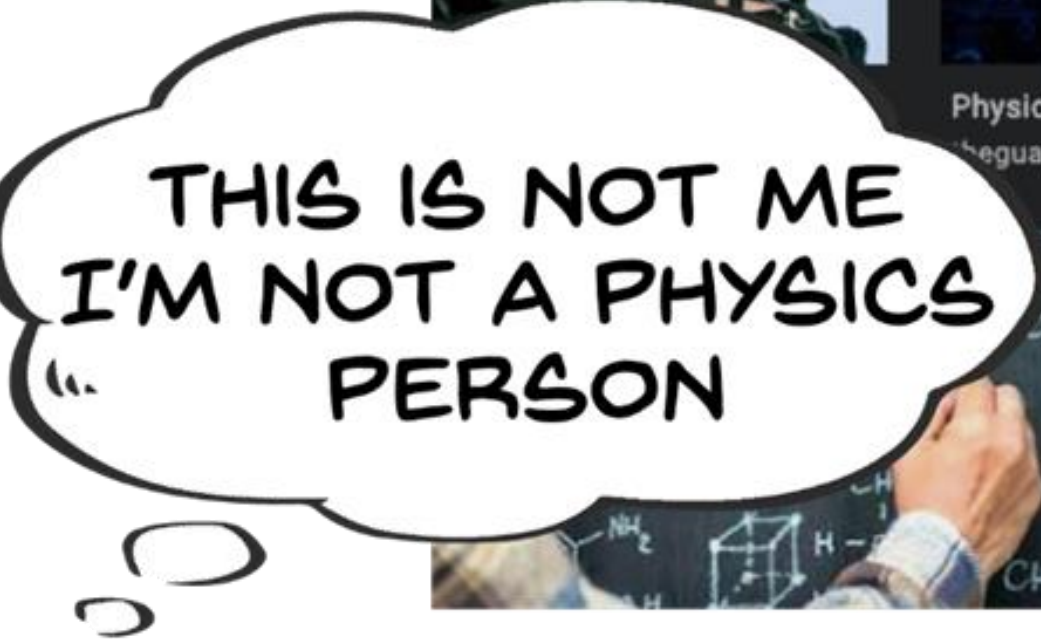
[STEPUPphysics.org](https://stepupphysics.org)

Hyater-adams et al (2018)  
Hyater Adams et al. (2019)



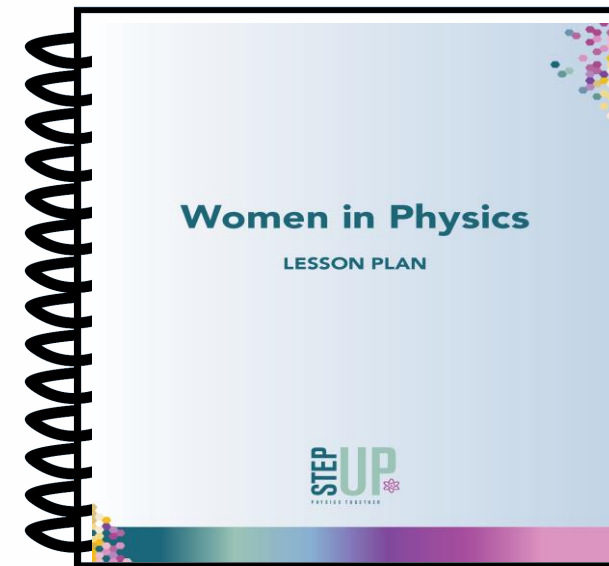
# Figured World of Physics

MENTAL  
MODEL OF  
**WHAT**  
PHYSICS IS  
  
AND  
**WHO**  
DOES  
PHYSICS

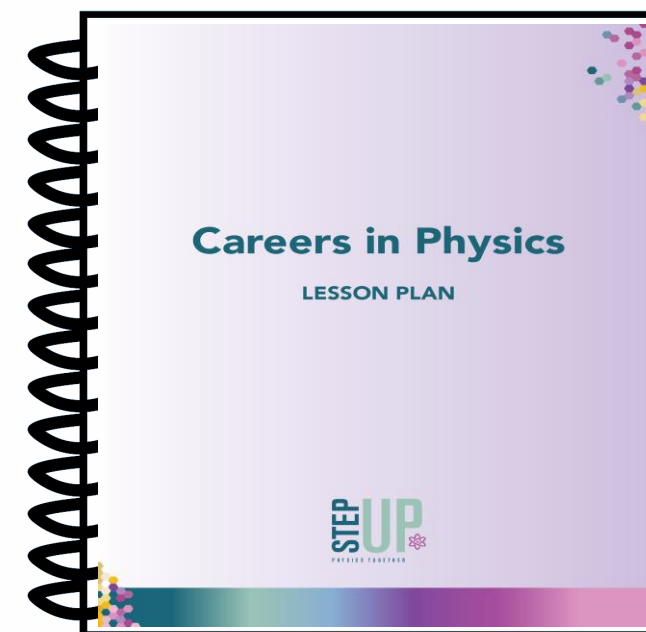




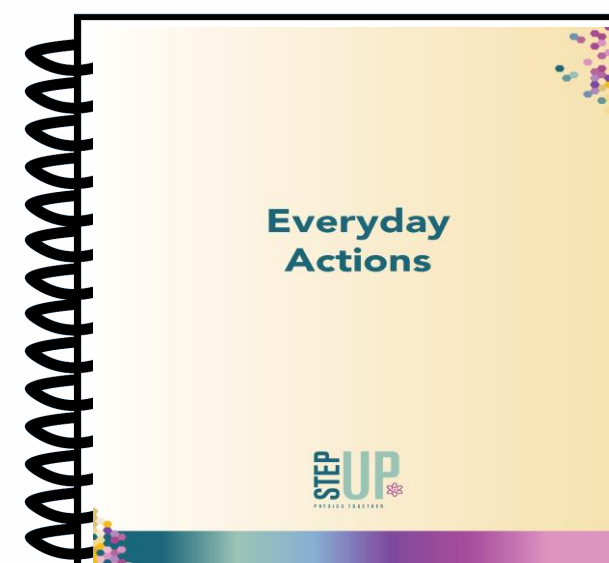
# STEP UP Counternarratives



- PHYSICS IDENTITIES ARE CULTURAL AND BIASED
- PHYSICS HAS BEEN DEFINED BY PEOPLE, PRIMARILY ONE GROUP

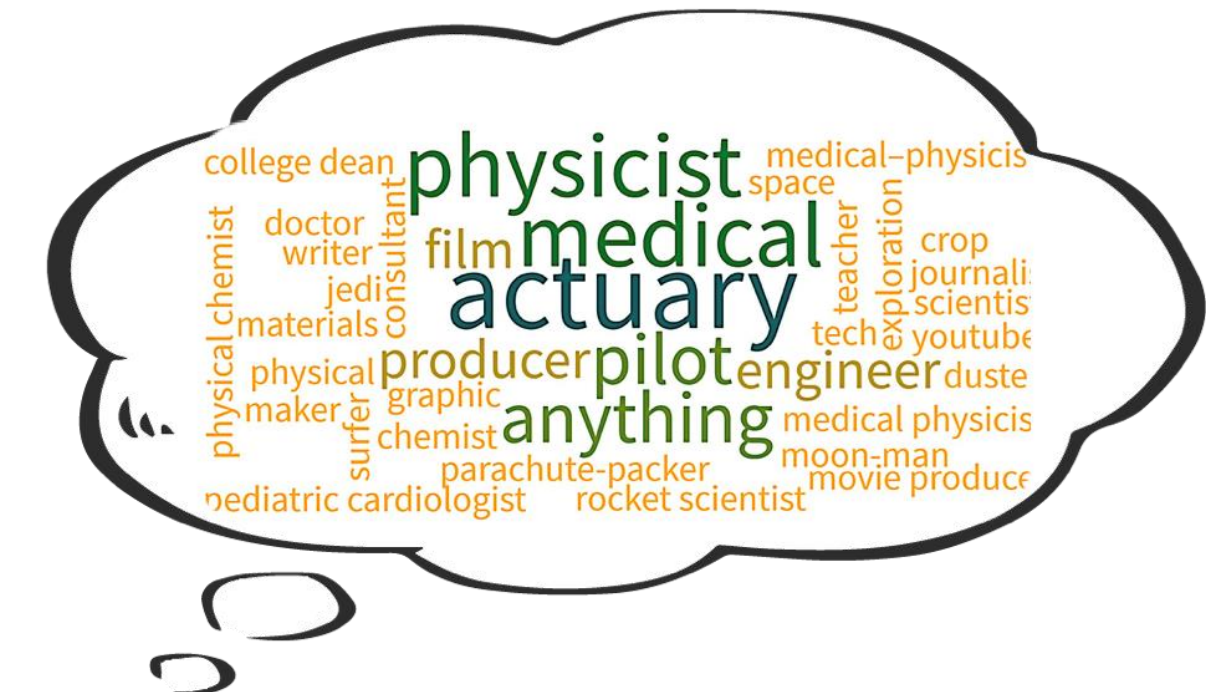


- PHYSICISTS ARE COMMUNAL
- PHYSICS CONNECTS WITH WHAT PEOPLE VALUE
- PHYSICS PROVIDES A WIDE SKILL SET



- RECOGNIZING WIDE SKILL SETS
- LEARNING PHYSICS AS COMMUNAL
- PHYSICS KNOWLEDGE IS GROWN WITH WORK

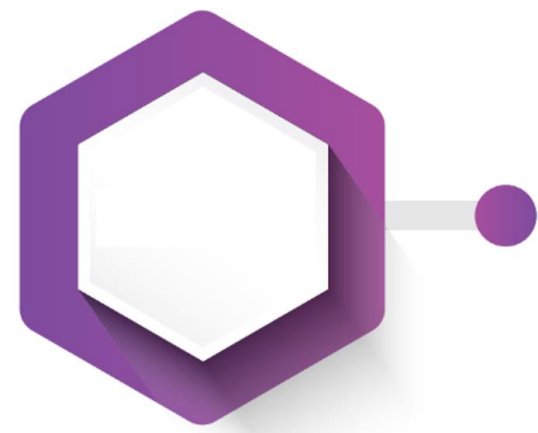
[STEPUPphysics.org](http://STEPUPphysics.org)



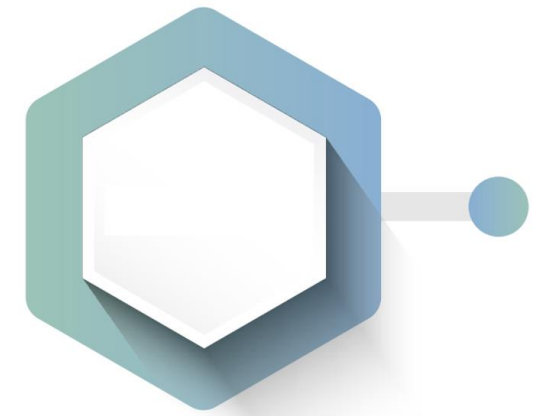


# Careers in Physics

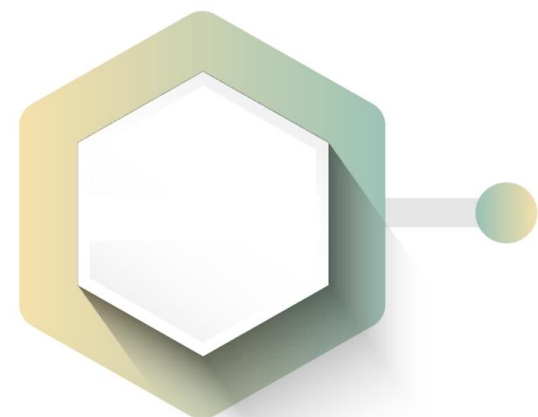
## Quotes from teachers who used the lesson



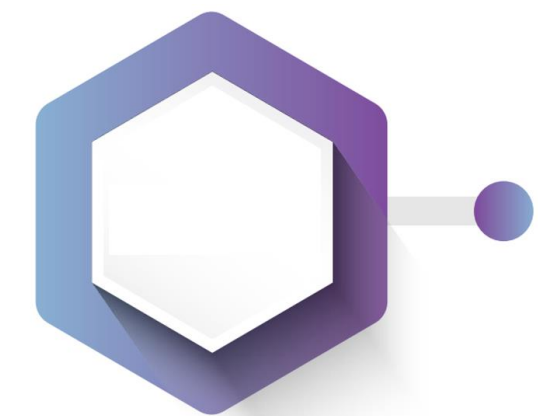
"Students don't realize all the things they can do with a physics degree."



"It helps students see that physicists can help the world and work with others."



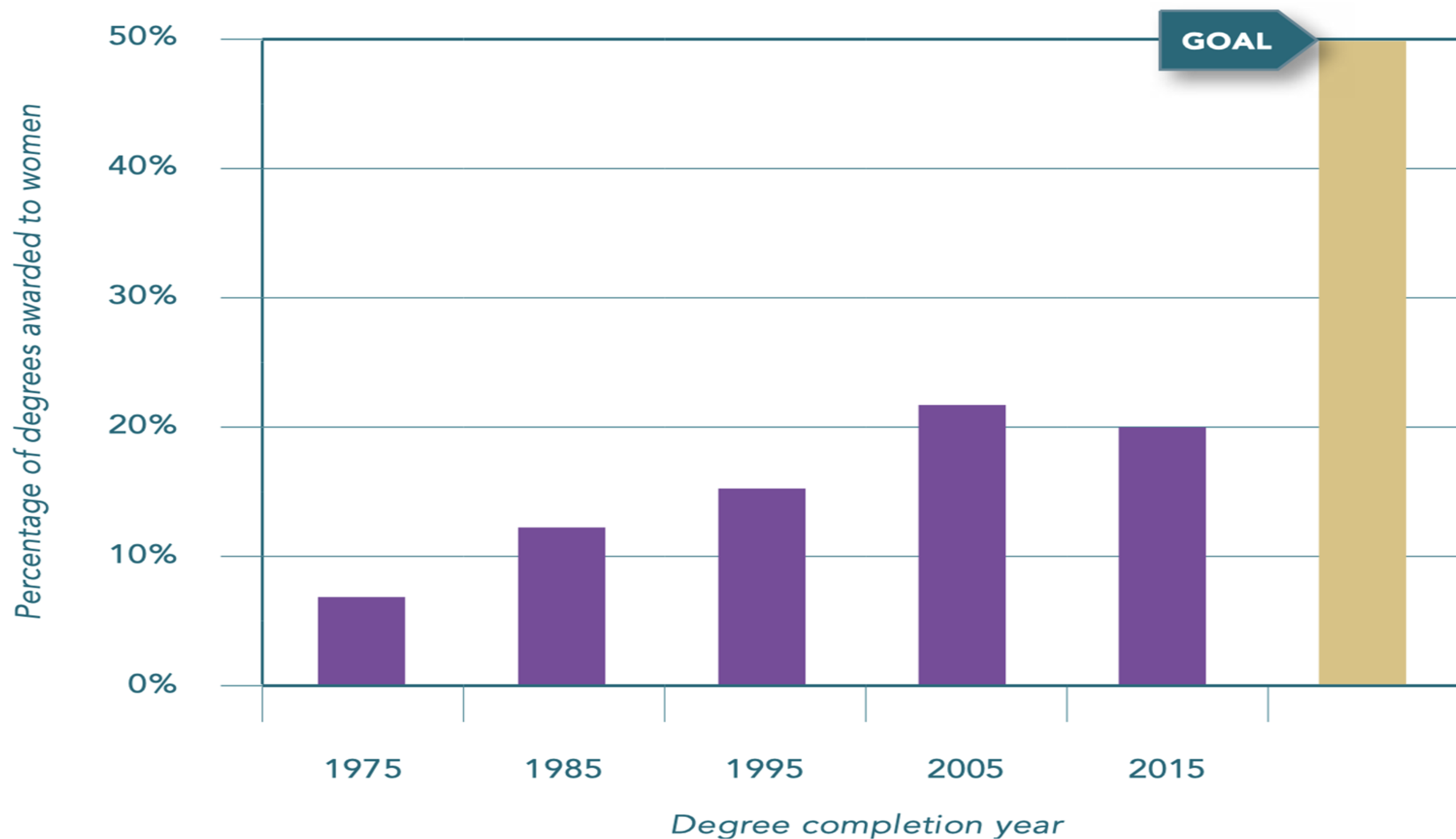
"The posters students make as part of the lesson help recognize students and who they are."



"As a student, I wish I had the opportunity of envisioning my future with physics."



# STEP UP: Goal



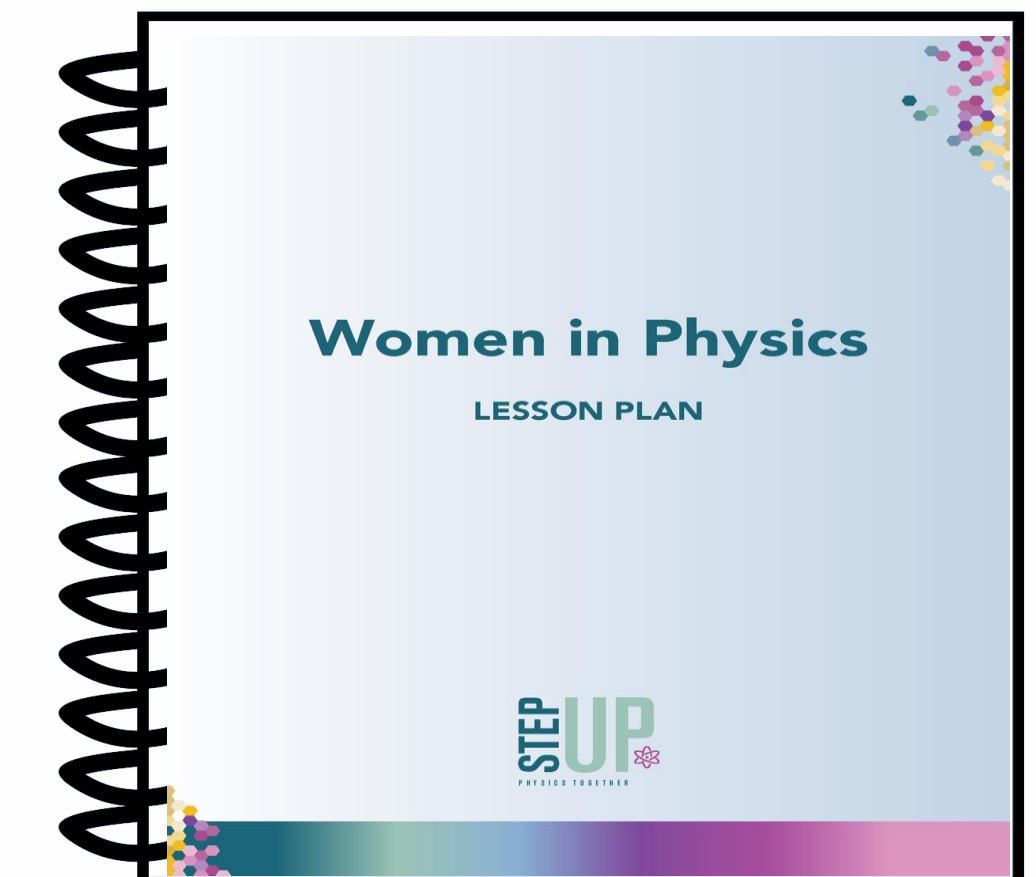
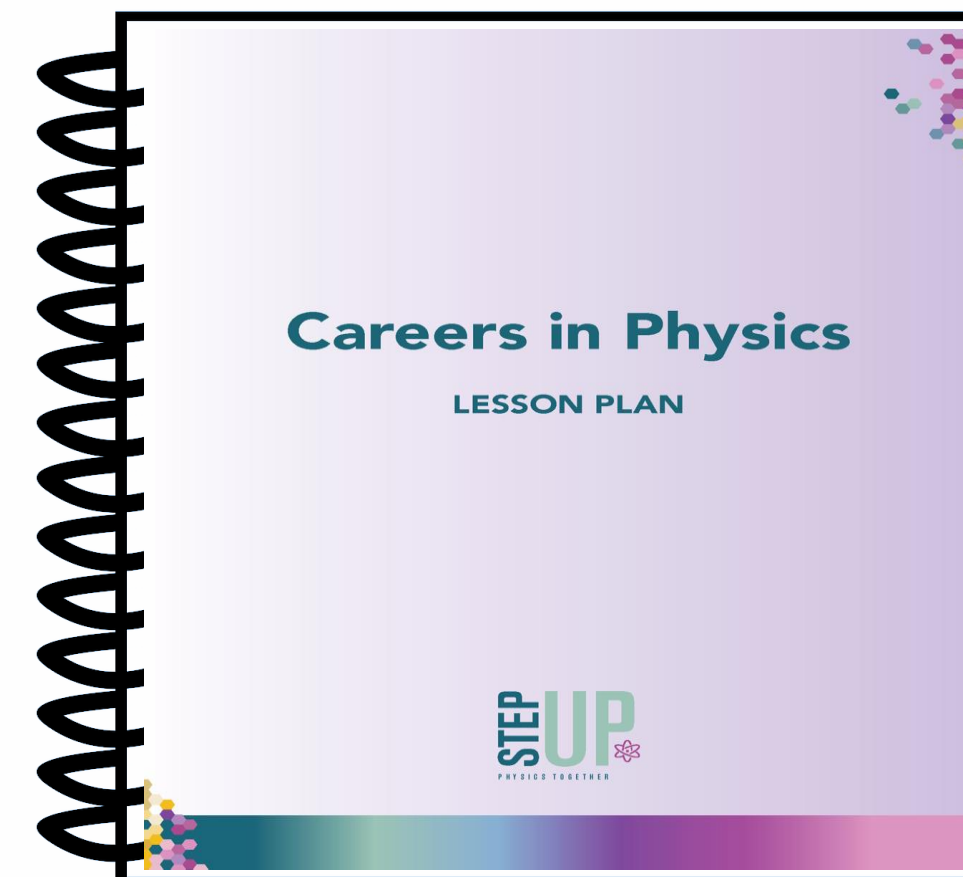
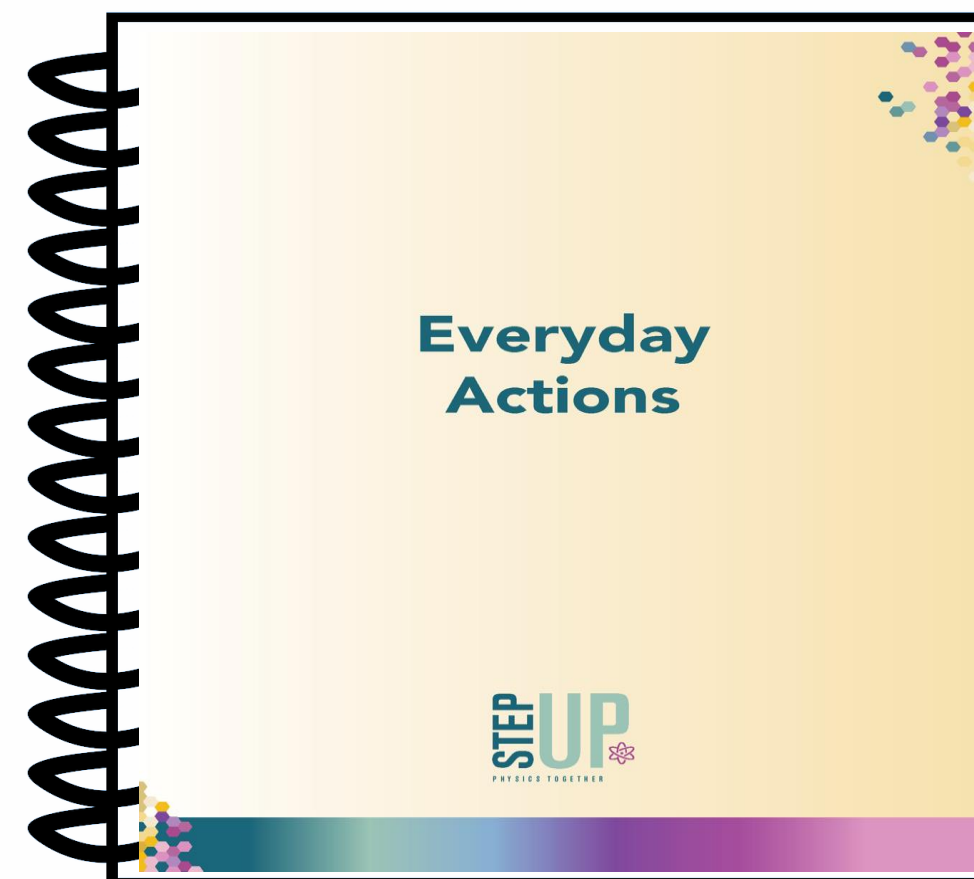
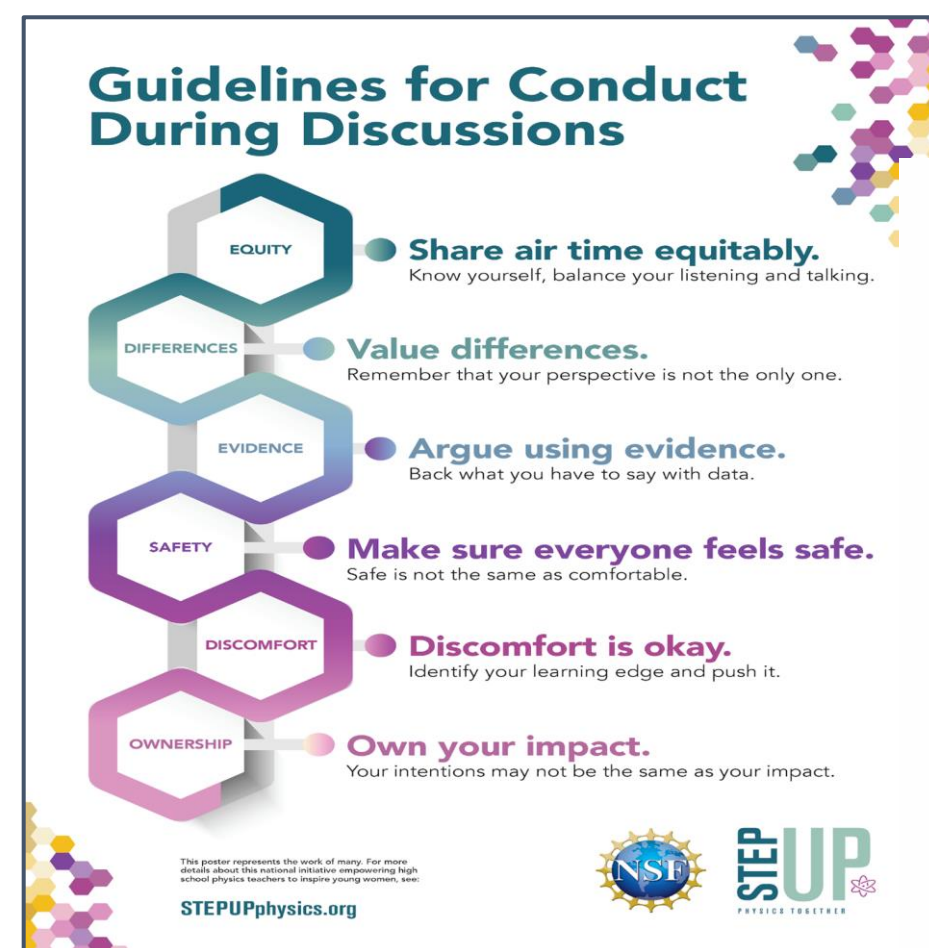


# How can you help?



1. Register NOW at  
[STEPUPphysics.org](https://STEPUPphysics.org)

2. Learn about and implement effective strategies



3. Inspire women! Teach lessons on careers and women in physics.  
4. Share with others!





# Thank You!



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[STEPUPphysics.org](http://STEPUPphysics.org)





# Conversations About STEM

## Stereotypes:

## Where Do We Start?



Michelle Higgins  
Associate Director, Societal Impact







# The Power of Circles

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## **Listening/Talking Circles**

Responsibility to listen

Listen to understand

Listen without  
judgement

## **Decenters and Redistributes**

There is no front, back,  
or center

No beginning or end

Everyone can be seen  
and heard

## **Promotes Whole Group Interaction**

Questions are addressed  
to group

Recognizes knowledge  
within group

<https://www.edutopia.org/article/using-circle-practice-classroom>

<https://www.heartland.edu/documents/idc/talkingcircleclassroom.pdf>

<https://www.co-intelligence.org/P-listeningcircles.html>



**Stereotypes** - “the pictures in our heads that simplify the world by saving us the trouble of thinking when we come into contact with people.” (Elliott & Dweck, 2005,P. 438)

## **Part 1: Create Common Ground**

1. Ask participants to identify STEM stereotypes
2. Be ready to fill in more stereotypes
3. Provide more information to ponder – short articles, videos, blogs



## **Part 2: Provide Processing Time with questions:**

1. Full circle – check-in about definition; they are not alone
2. Individual time – check-in with themselves
3. Small group time – process with small group
4. Full circle time – share out
5. Be ready to fill in

## **Sample Probing Questions:**

1. What is true for you?
2. What have you observed?
3. Do STEM stereotypes still exist?
4. How do we counteract STEM stereotypes?
5. Is there any truth to STEM stereotypes?
6. What are the consequences of STEM stereotypes?

# Take-Away Thoughts

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1. Give participants a chance to process
2. Continue listening without judgement
3. Perspectives may not change immediately
4. Continue checking-in

Trust the Process





# Thank you

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[mlhiggins@arizona.edu](mailto:mlhiggins@arizona.edu)

# Q & A

We'll take questions from the chat and from people using the 'hand raise' function.



# Call to action!

Type in the chat...

Write 1 strategy, approach, or resource you will dig into related to addressing STEM stereotypes with youth and young adults after this webinar.



# Upcoming NGCP Events

- **Addressing STEM Stereotypes with Young Children** – Thursday October 20<sup>th</sup>, 2022 at 11am Pacific / 2pm Eastern
- **STEM Stories: Women's Experiences Advocating for Equity** – Thursday November 1<sup>st</sup>, 2022 at 11am Pacific / 2pm Eastern







**20 YEARS** OF TRANSFORMING STEM

Learn more at [ngcproject.org](https://ngcproject.org)

Webinar Questions? Contact: [asullivan@ngcproject.org](mailto:asullivan@ngcproject.org)

