

Low risk, high reward strategies for making your teaching more inclusive

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Objectives

- Identify and use several in-class assessment techniques/
Identifica y utiliza diferentes tecnicas de evaluacion en clase
- Discuss hidden barriers that may persist in our courses, and the critical role your sessions can play in lowering some of these barriers/
Discute sobre las barreras o dificultades no evidentes, que identificas en tus cursos, y el rol que tus sesiones pueden desempenar para reducir o eliminar esas barreras
- Develop strategies for implementation in your own sessions/
Desarrolla estrategias que puedas poner en marcha en tus propias sesiones.

What does it mean to be inclusive?/Que significa ser inclusivo?

- Promoting and fostering inclusion means engaging all students in all aspects of the educational process, promoting collaboration and interaction and providing opportunities for all to succeed. Inclusive teaching is especially critical because education is the basic foundation for all political, economic, social and personal development.
- *Promocionar y estimular la inclusion significa involucrar a los estudiantes en todos los aspectos del proceso educacional, promocionando la colaboracion e interaccion y proveyendo oportunidades para que todos tengan exito. La enseanza inclusive es particularmente critica porque la educacion es la fundacion clave de la politica, la economia, la Sociedad y el individuo.*

Question 1. Do you think that science teaching at your institution is *inclusive*? (throat vote)

1. Not at all
2. Somewhat
3. Very much so
4. There are no problems there
5. I don't know

My assumptions/*Mis asunciones*

- Full participation in Science, Technology, Engineering, and Math (STEM) is currently constrained by numerous barriers that disproportionately disadvantage certain groups of students over others/*La participacion total en Ciencia, Tecnologia, Ingenieria y Matematica (STEM) esta actualmente limitada por numerosas barreras que generan desventajas desproporcionales entre los distintos grupos de estudiantes*
- Equity in STEM is a shared goal/*La igualdad en STEM es un objetivo compartido*
- We've all made mistakes, but we all want to be inclusive (in our research, advising, and teaching)/*Todos hemos cometido errores, pero todos queremos ser inclusivos (en nuestras investigaciones, aconsejando y enseñando)*
- Instructional choices matter/*Las decisiones de instruccion importan*

Question 2: Do we have a problem with respect to inclusivity in STEM? How do we know?
Pregunta 2: Tenemos un problema con respect a la inclusividad en STEM? Como lo sabemos?

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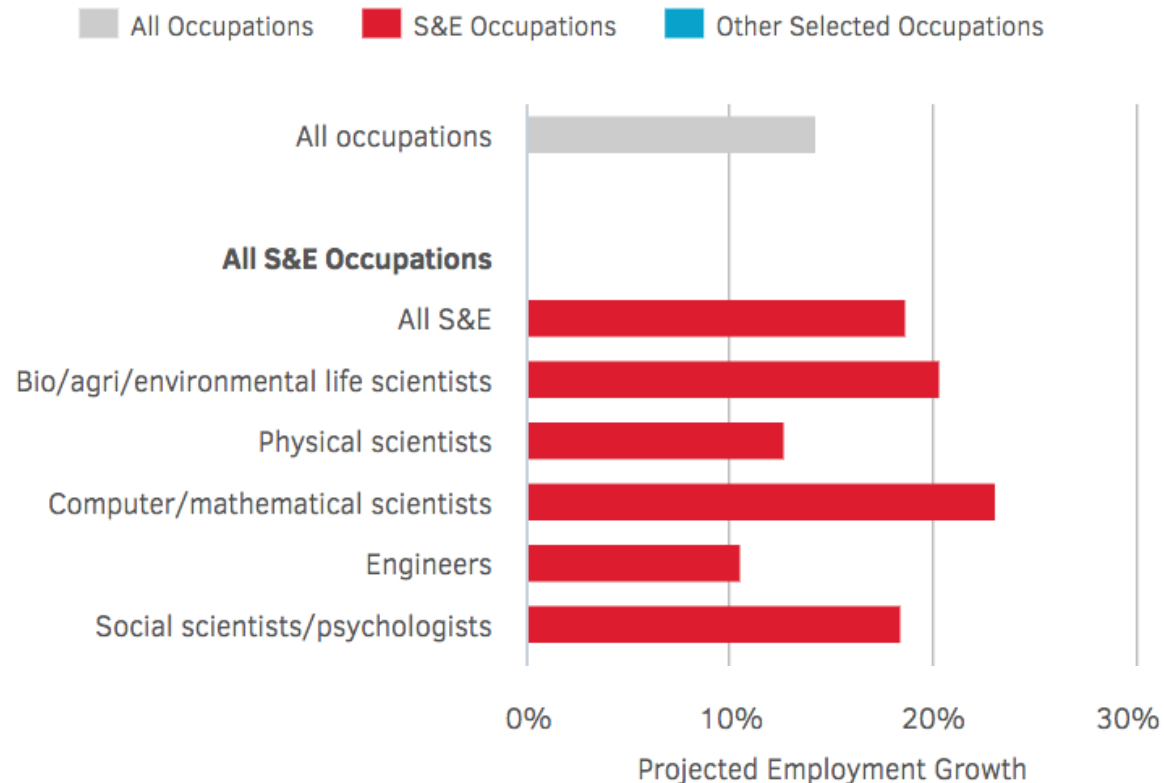
Pair

Share: multiple hands, multiple voices

STEM Employment Outlook

STEM jobs are growing faster than any other U.S. sector.

Bureau of Labor Statistics' projected increases in employment for
S&E and selected other occupations: 2010–20



Notes:

S&E = science and engineering.

Physical scientists = chemists, physicists, astronomers, and earth/ocean/atmospheric scientists.

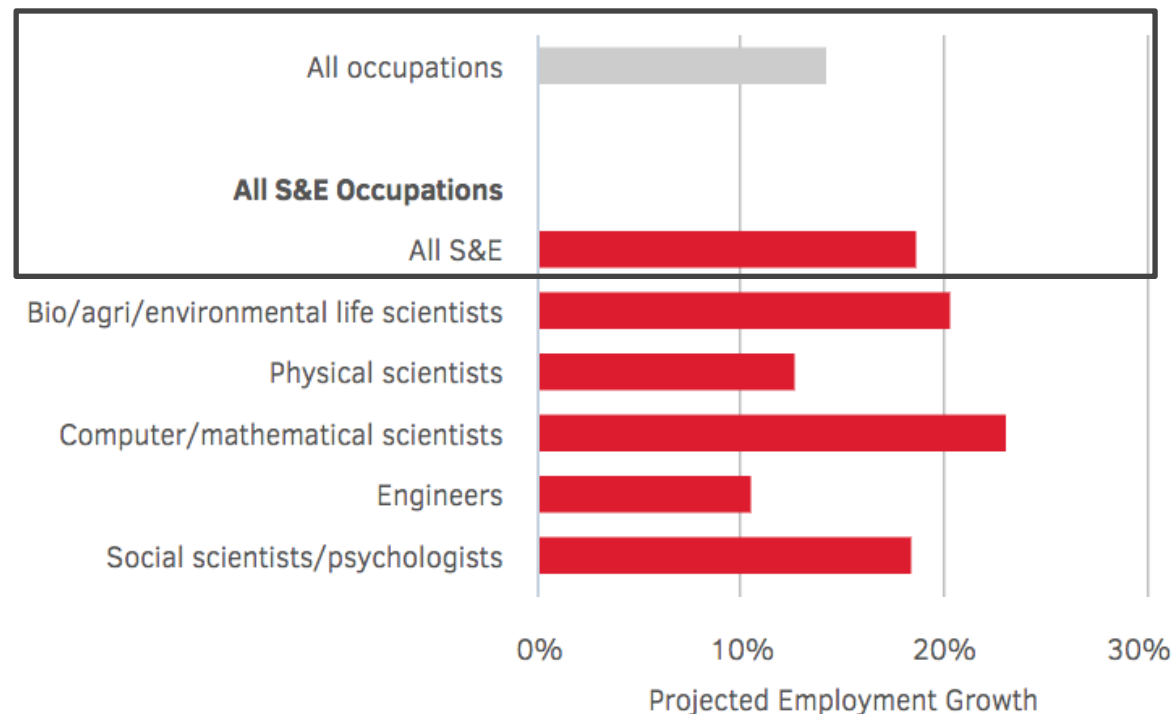
Source: [National Science Foundation](#)

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■ All Occupations ■ S&E Occupations ■ Other Selected Occupations



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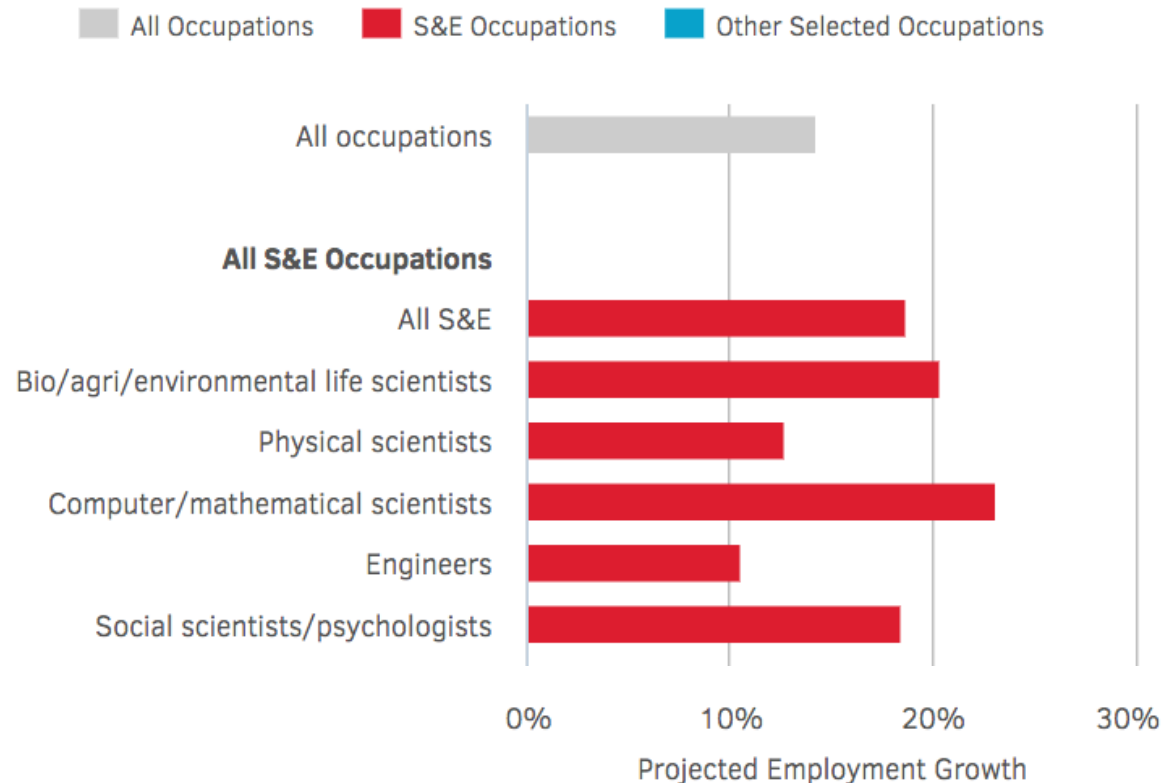
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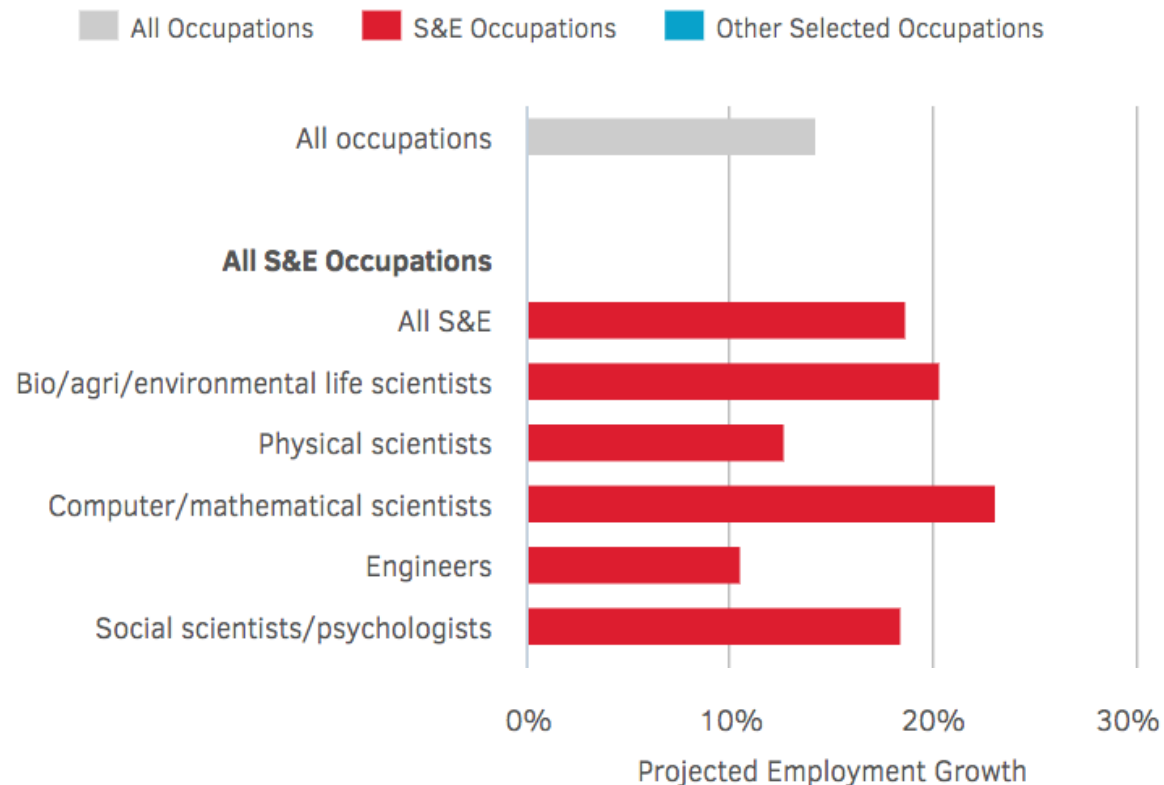
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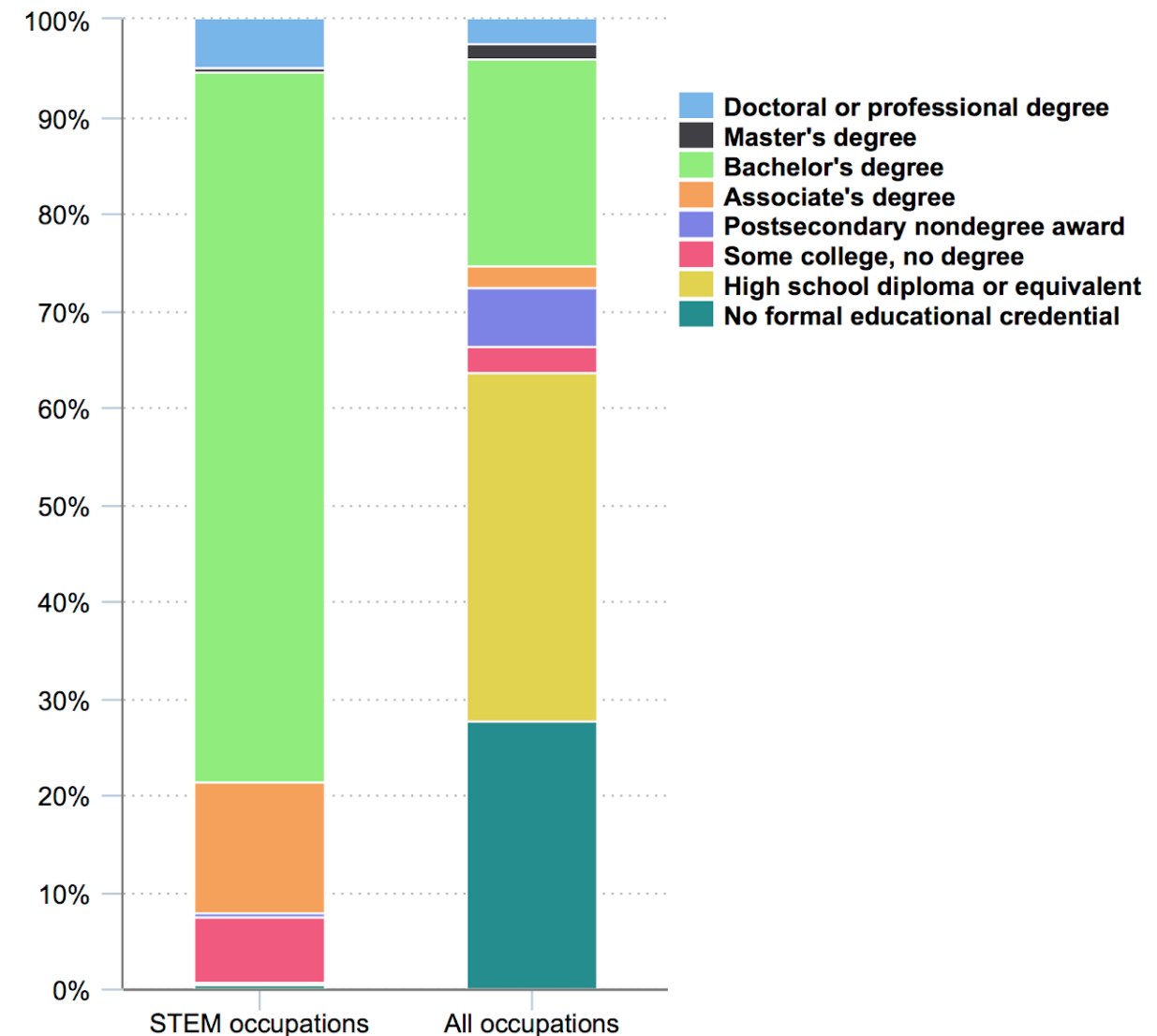
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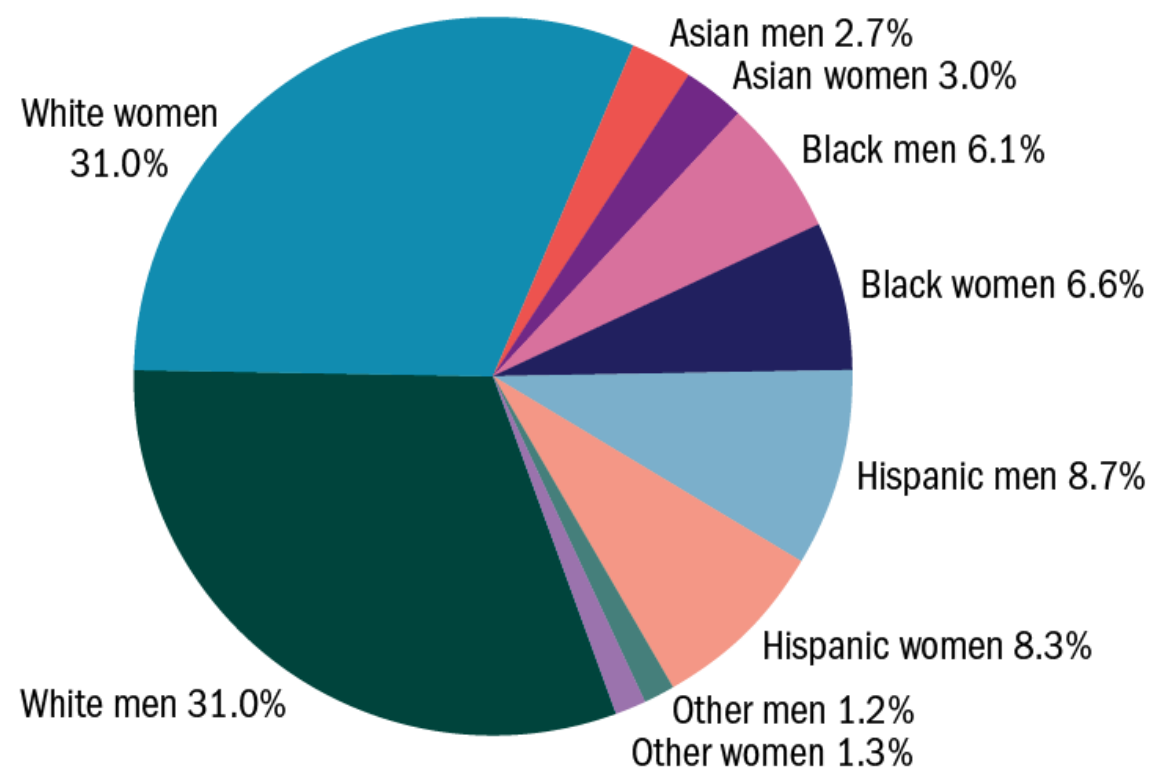
STEM occupations have high educational requirements



Source: [US Bureau of Labor Statistics](http://www.bls.gov)

Women, persons with disabilities, and three racial and ethnic groups are underrepresented in STEM

Non-Institutionalized Resident US Population
Ages: 18-64, by race, ethnicity, sex
2014



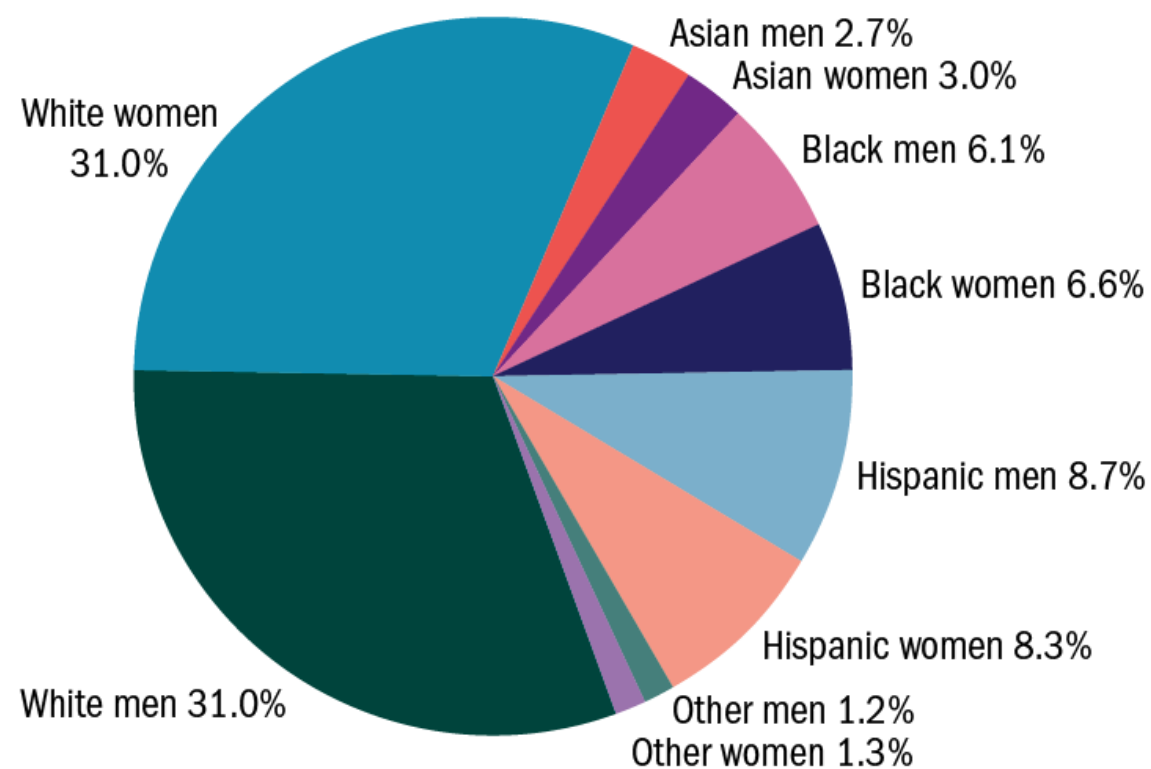
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Other includes individuals not of Hispanic ethnicity who reported more than one race or a race not listed separately.

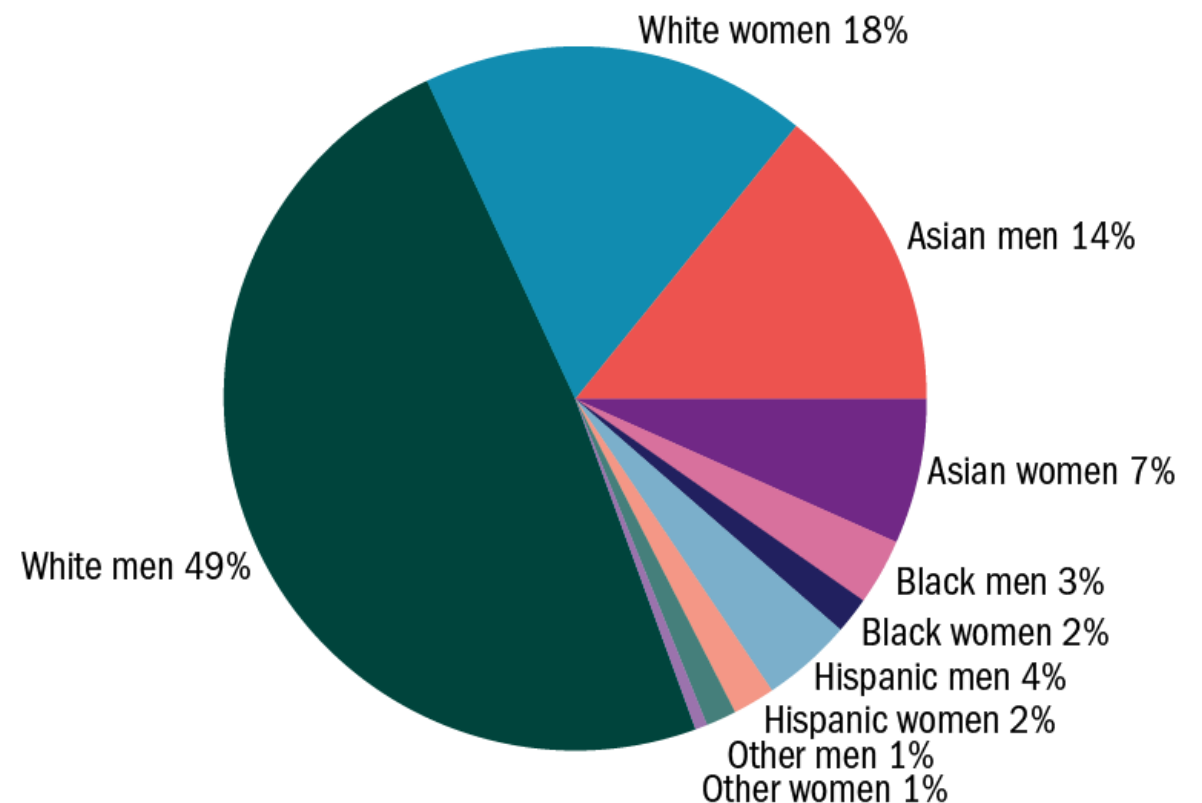
National Science Foundation, National Center for Science and Engineering Statistics. 2017. *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2017*. Special Report NSF 17-310. Arlington, VA. Available at www.nsf.gov/statistics/wmpd/.

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Recent report by the non-profit Campaign for College Opportunity, *Left Out: How Exclusion in California's College and Universities Hurts Our Values, Our Students, and Our Economy*:

- In the CSU system, 75% of Cal State students are students of color and 38% of tenured faculty are non-white
- In the UC system, 74% of students are students of color and 26% of tenured faculty are non-white
- In the CCC system, 73% of student are students of color and 39% of tenured faculty are non-white.

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M8B Share: pick the person who woke up earliest this morning

My challenges with students

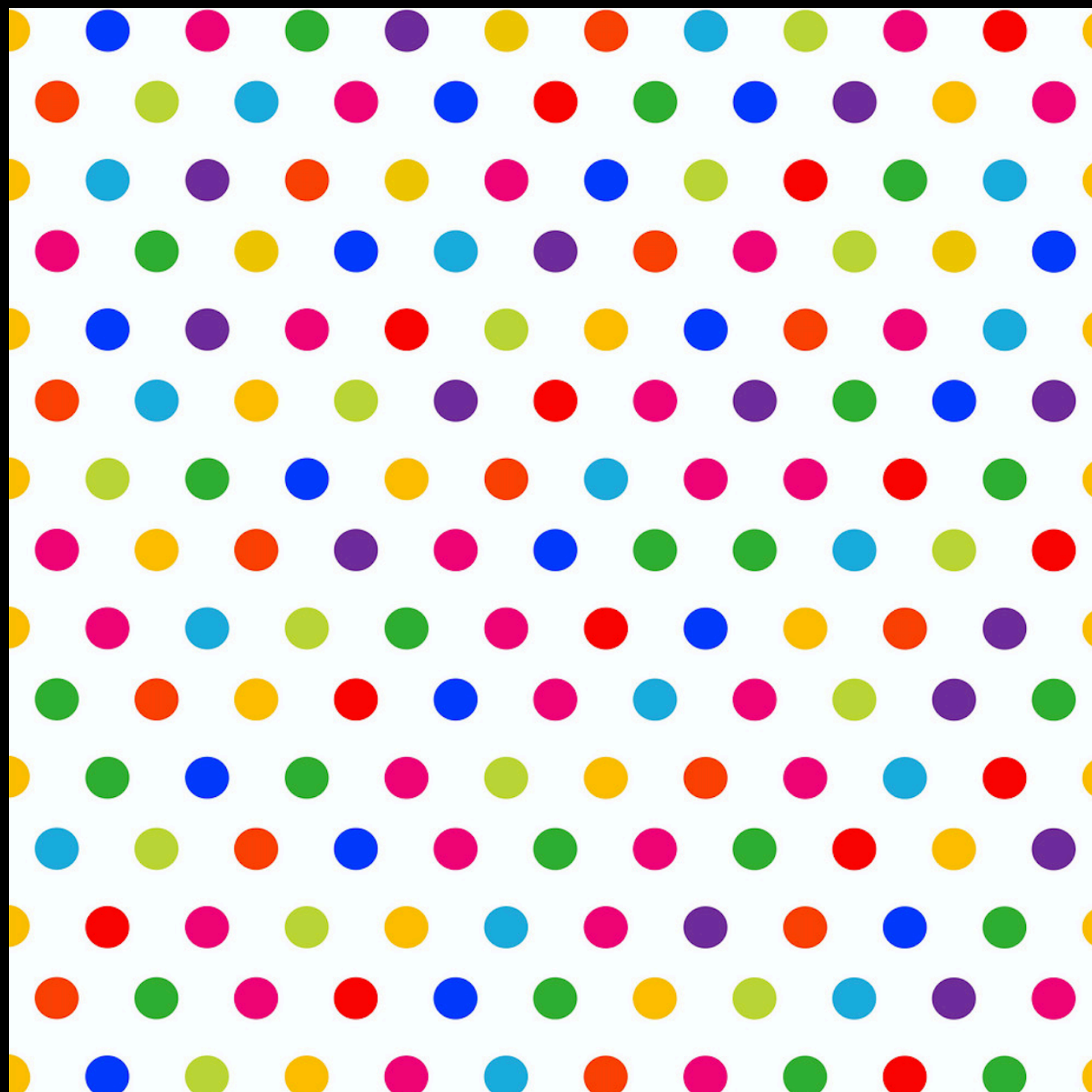
- Test anxiety
- Implicit bias and stereotype threat
- Limited role models and reduced STEM identity
- Feelings of exclusion and uneven participation
 - “Othering” during group work

Have you ever...

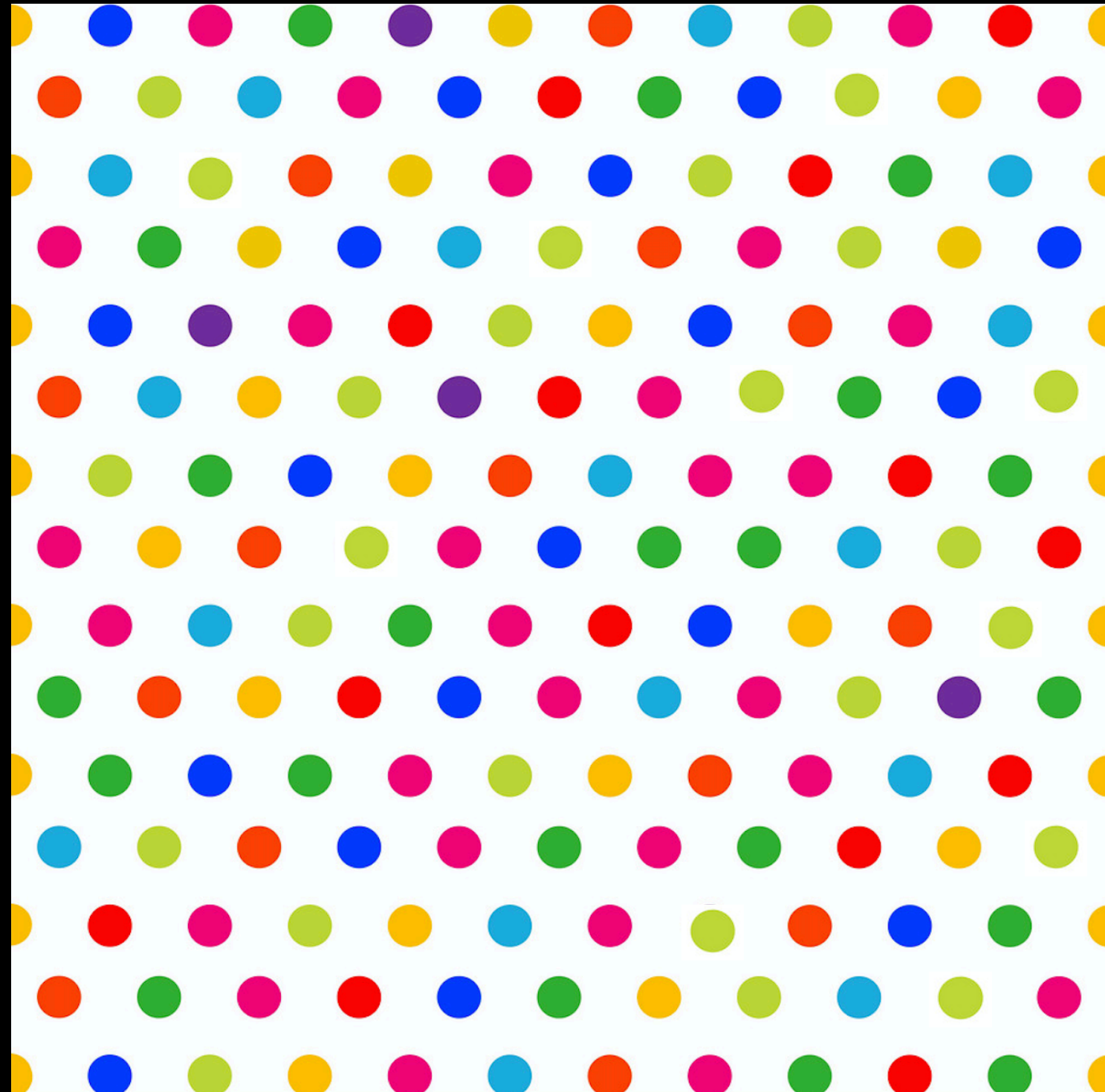
- Referred to any group (e.g., Young Earth creationists, anti-vaxxers) as “those people”?
- Said “I know you’ve already learned this topic a million times” or “I know this is familiar, but...” or “I know this part is super-easy”?
- Conveyed to a student assumptions about their sexuality, gender, politics, religion, etc?

I have done all of these things

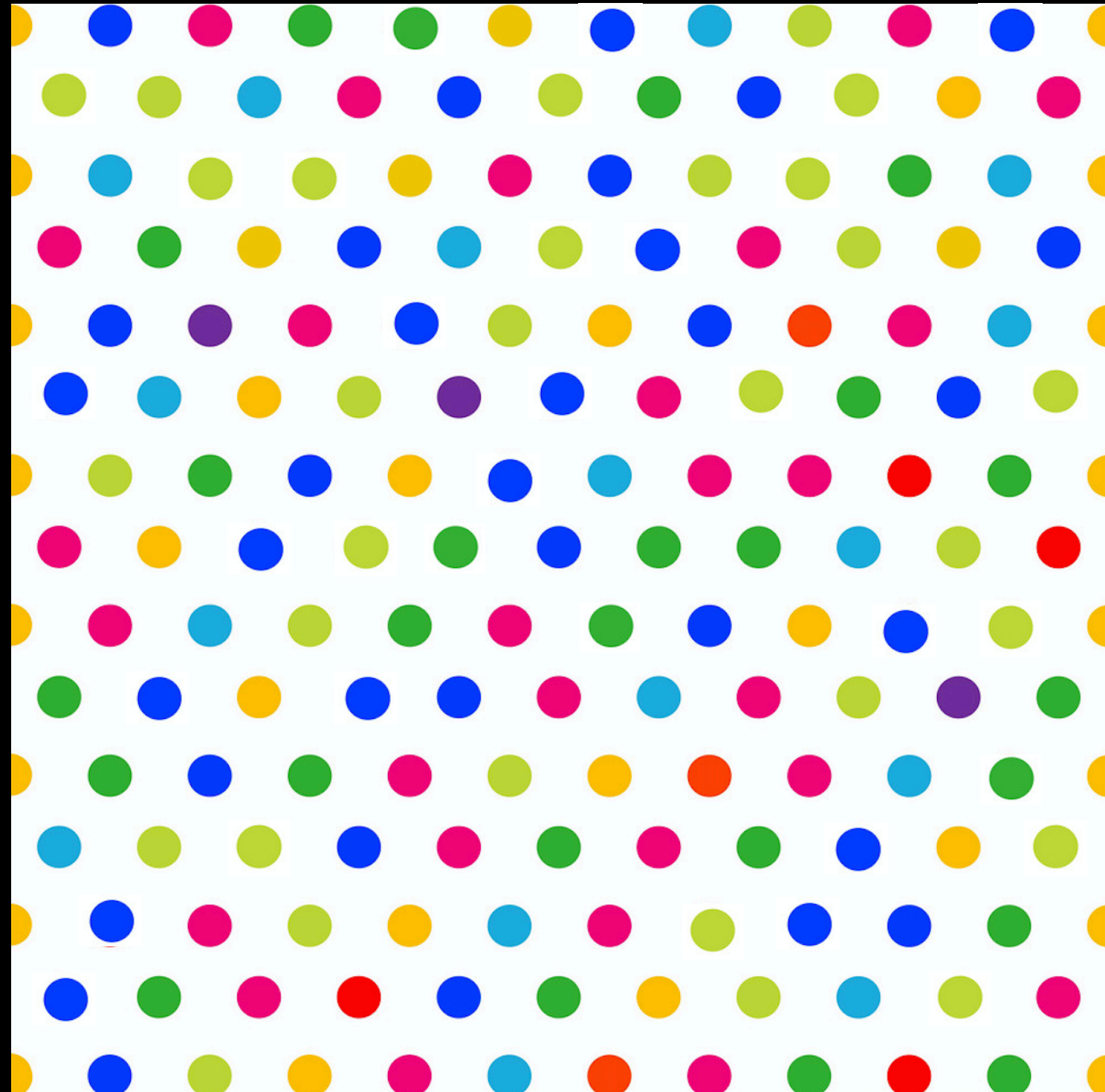
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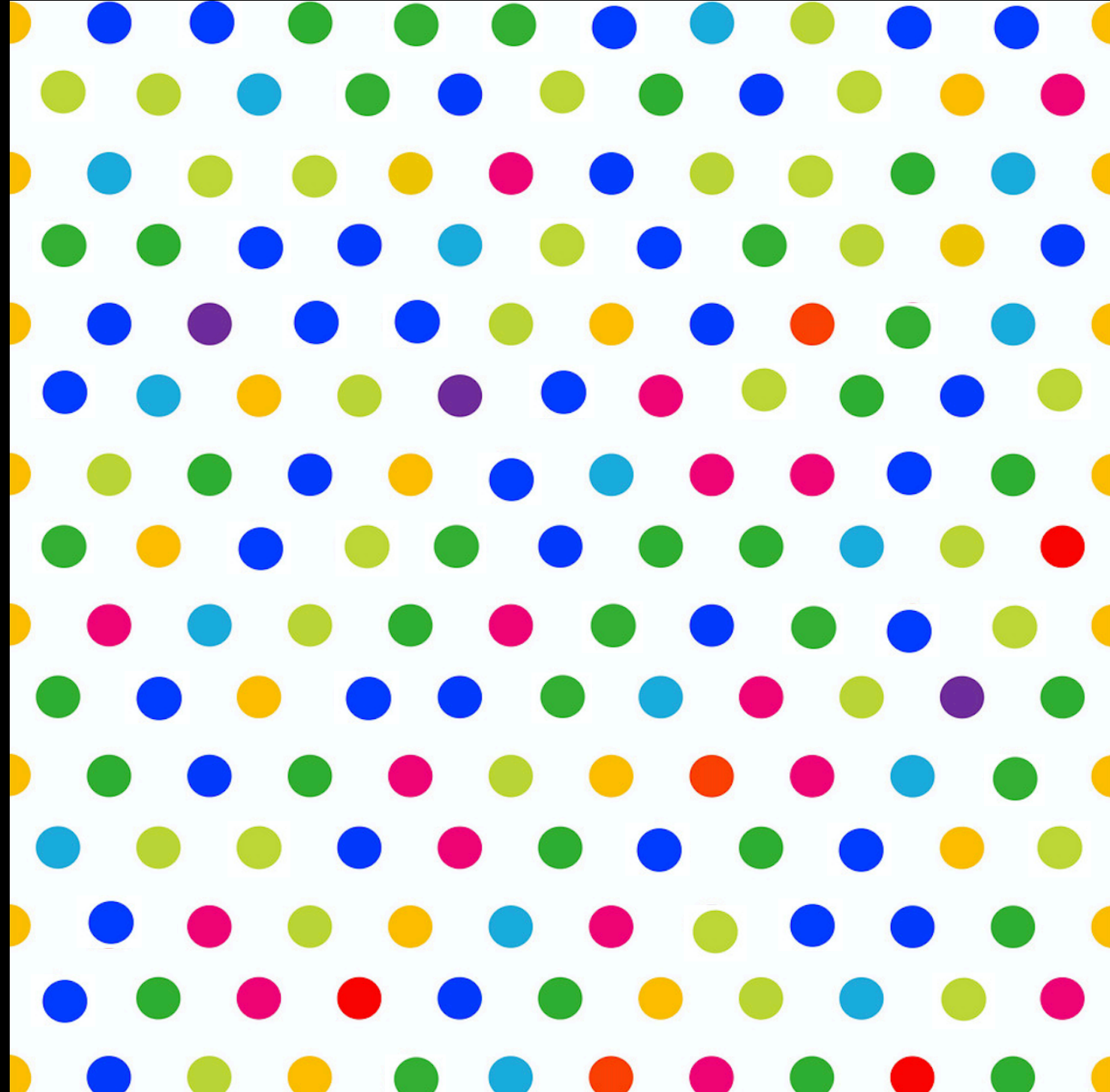
Test anxiety negatively and disproportionately impacts women, first-generation college students, and underrepresented racial/ethnic minorities



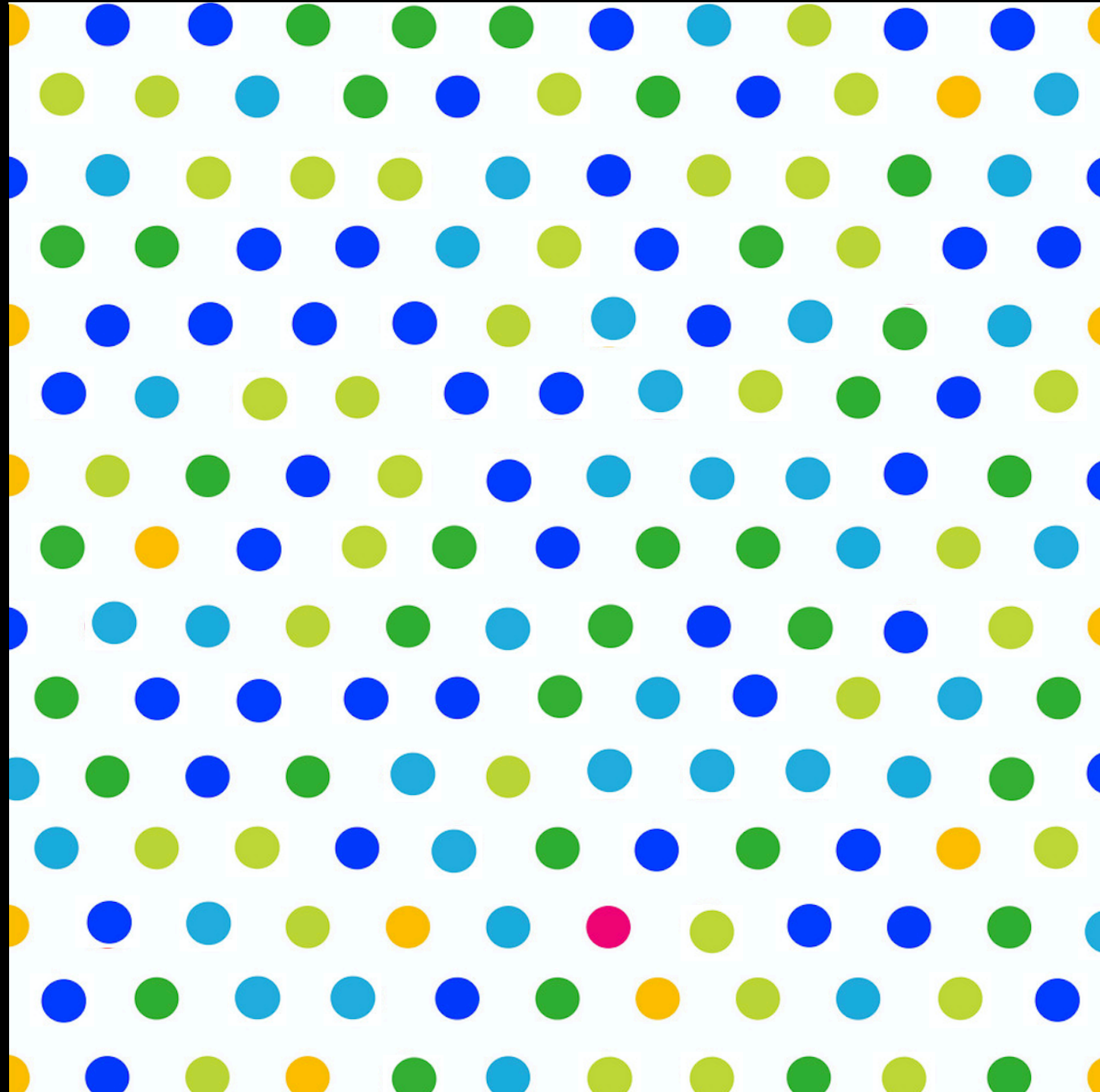
Our implicit biases, in concert with students' own knowledge of stereotypes, impacts performance, participation, and retention in STEM



Limited role models communicate to students that “their kind” doesn’t belong in STEM



Group dynamics highlight individual differences and primarily disadvantage minorities (racial, gender, sexual-orientation, socio-economic, etc.)



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- To reveal our own commitment to diversity?/*Para mostrar nuestro compromiso con la diversidad?*

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Question 4. What can we do?

Think, Ink (2 minutes)

- To reduce test anxiety?
- To overcome implicit bias?
- To broaden the students' views of who does science?
- To encourage equitable participation?
- To foster respectful and productive group work?
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Question 4. What can we do?

Think, Ink (2 minutes)

- To reduce test anxiety?

- To overcome implicit bias?

- To broaden the student body?

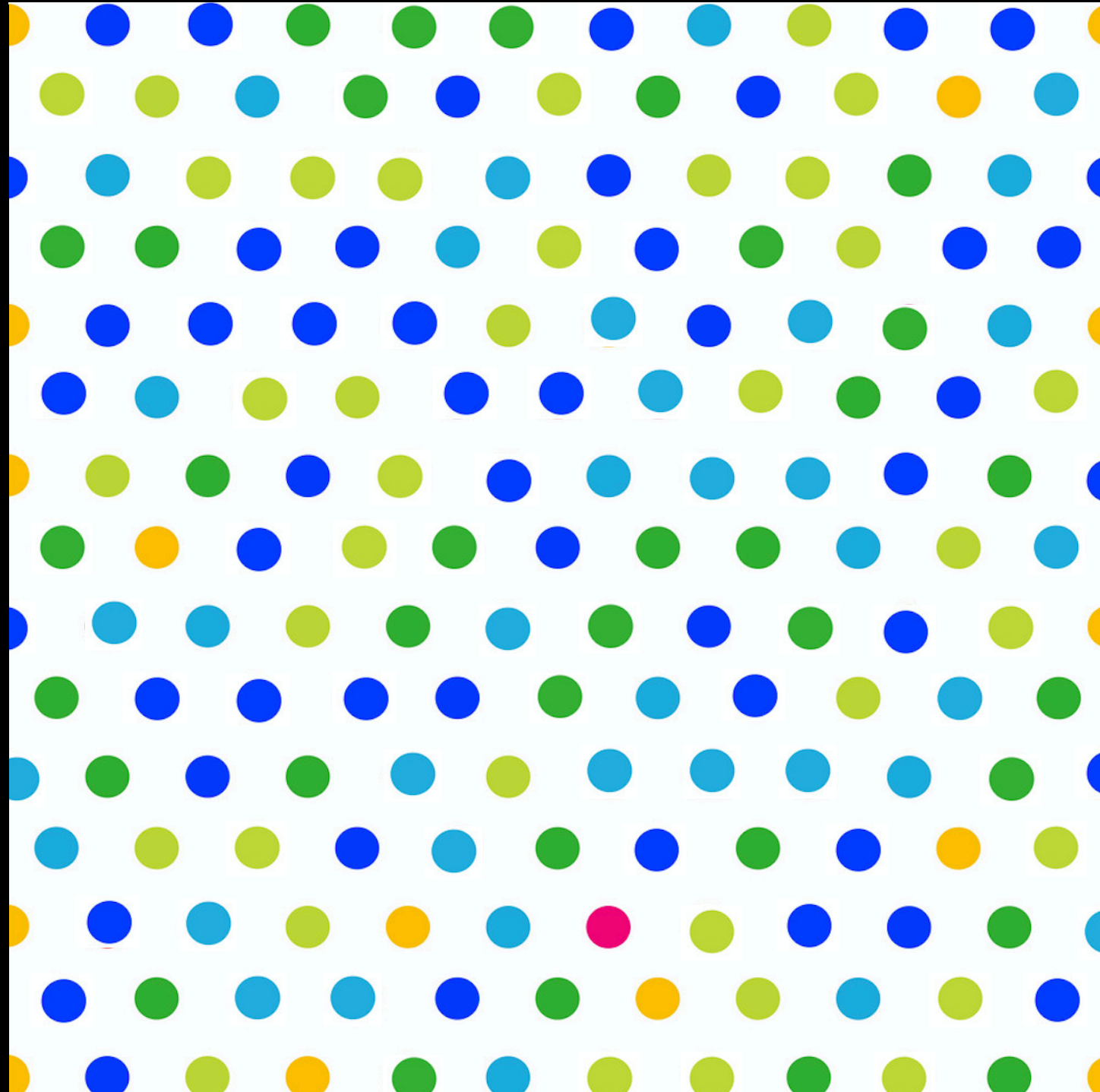
- To encourage equitable participation?

- To foster respectful and productive group work?

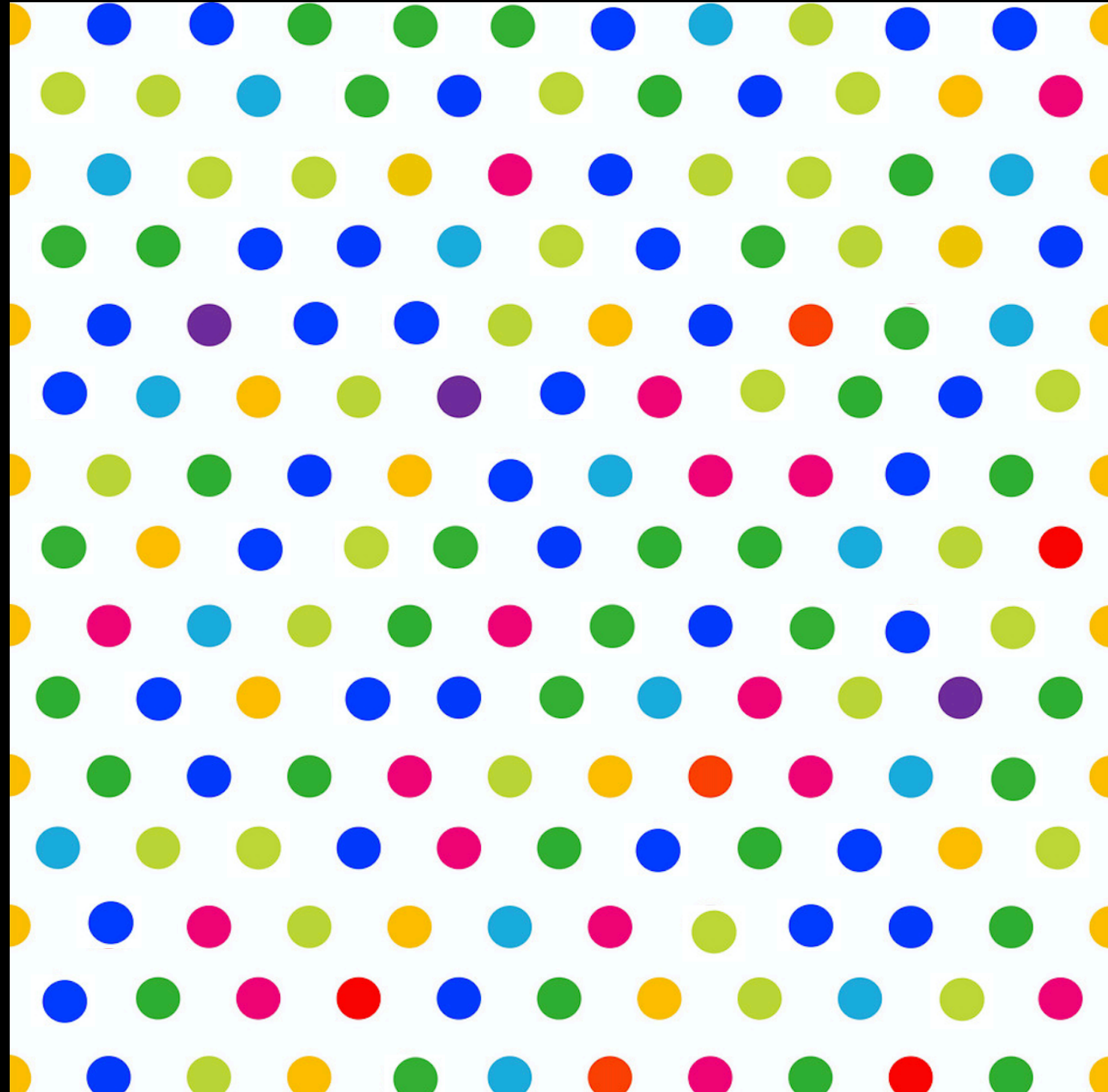
- To reveal our own commitment to diversity?

Carousel at the board (3 minutes):
add two or more ideas to two or more categories, then read others' ideas and add your thoughts, or simply add a “check” to ideas you like

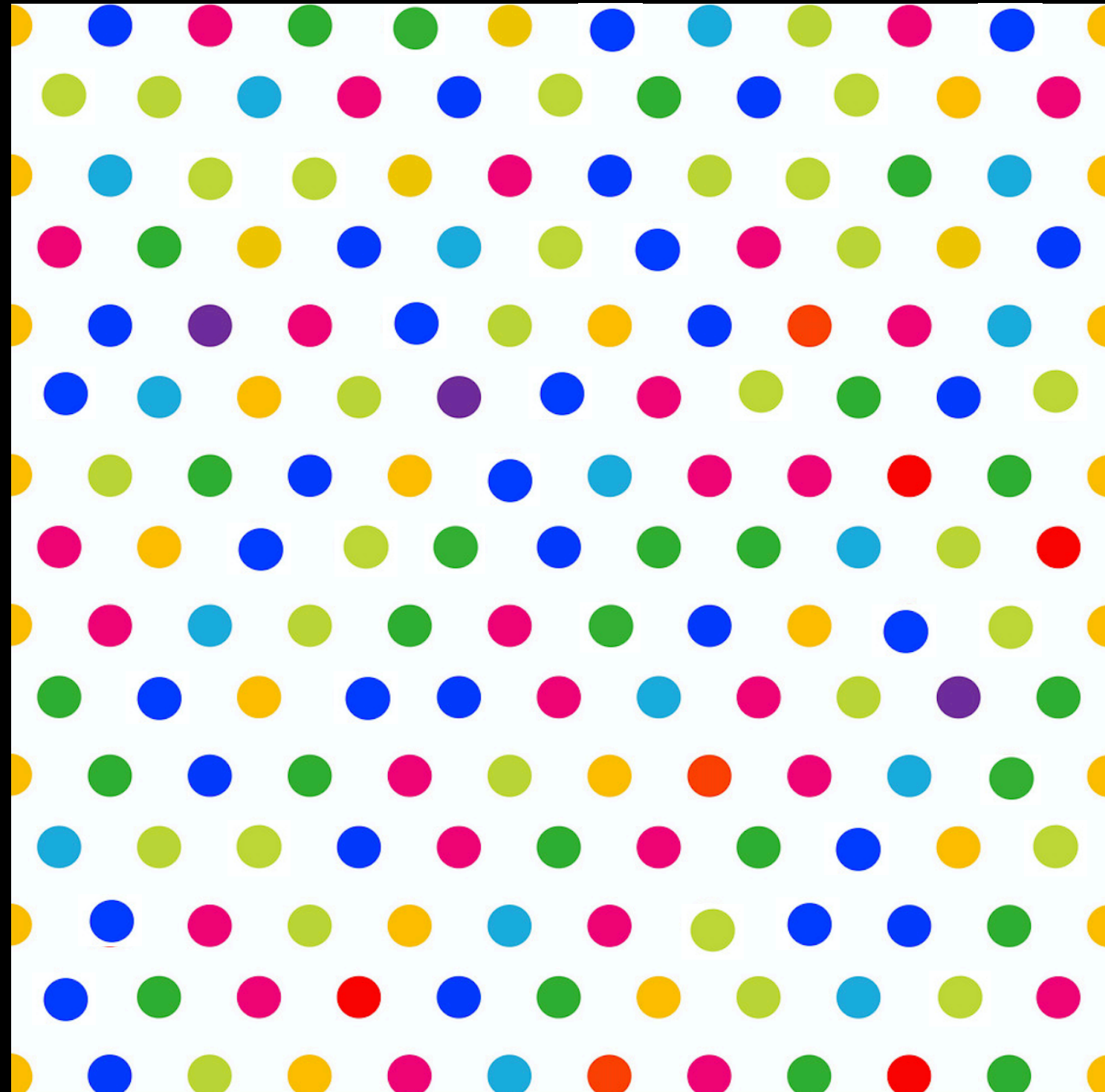
- To reduce test anxiety: minimize the impact of a single metric, use affirmation exercises



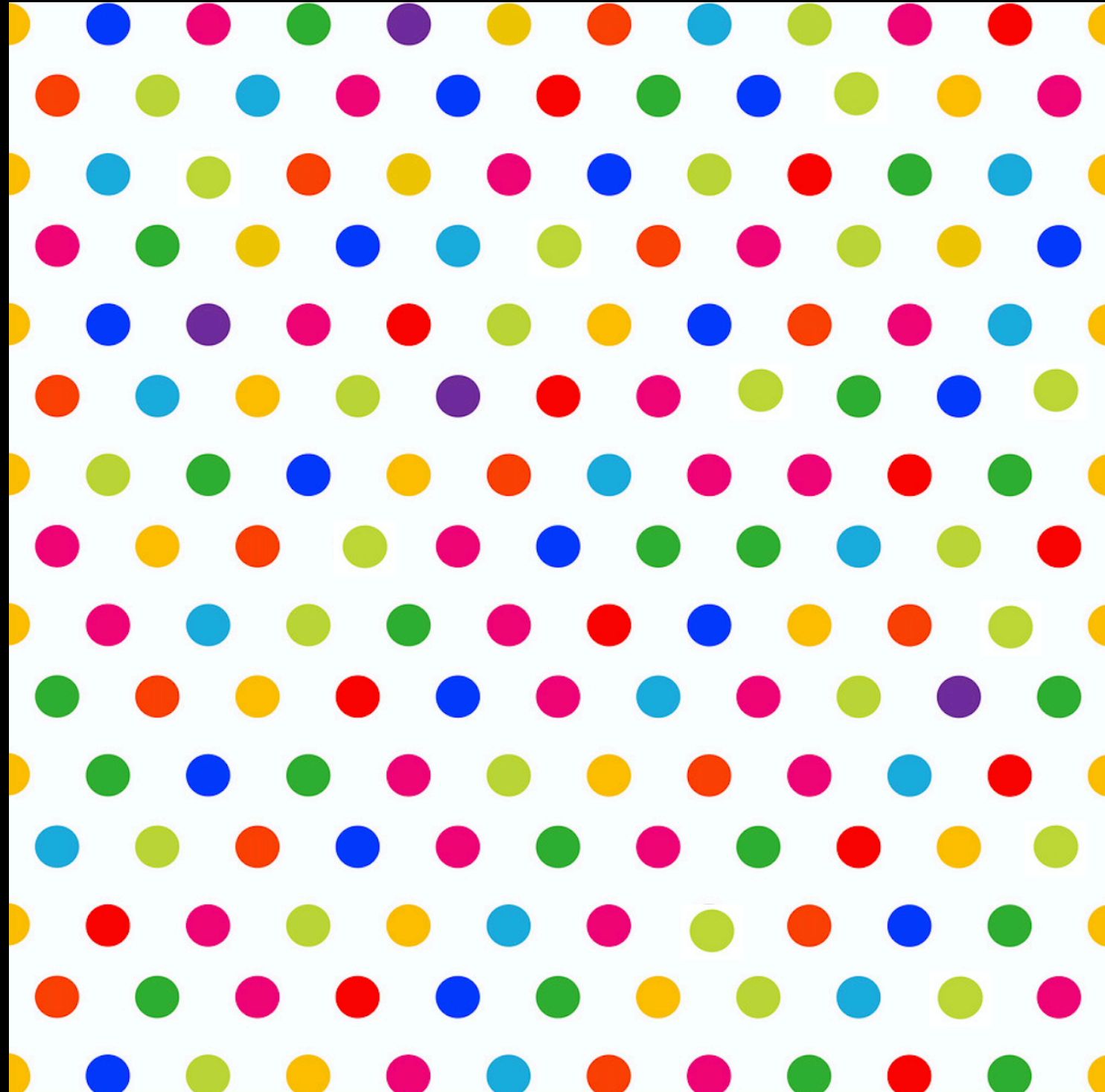
- To overcome implicit bias: grade anonymously, use rubrics, get backup for biases you've identified



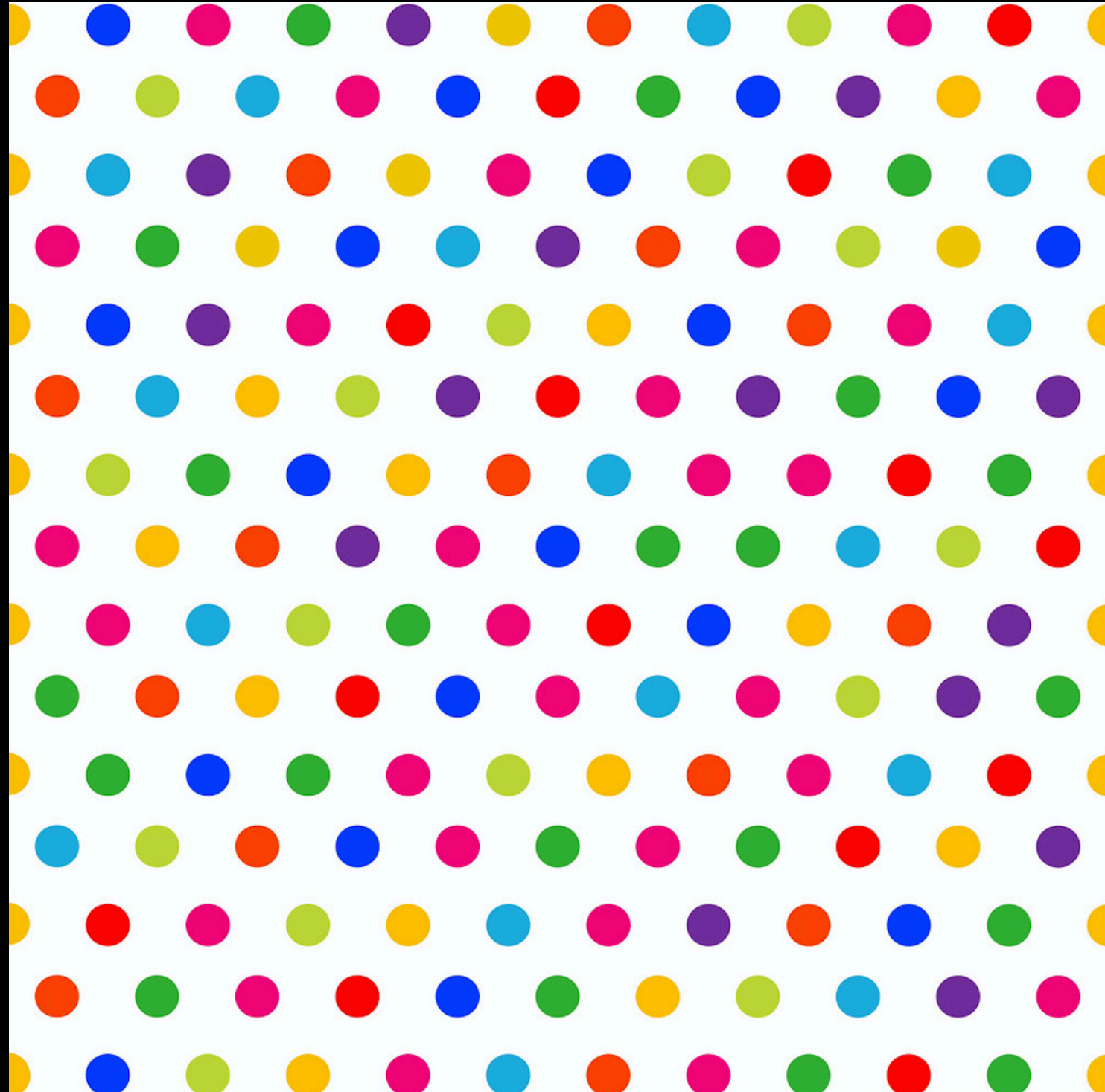
- To broaden the students' views of who does science: strategically use diverse range of scientists in your examples; acknowledge historical bias



- To encourage equitable participation: use some of the in-class strategies we've demonstrated today; make participation regular and routine



- To foster respectful and productive group work; assign groups randomly; set expectations for group work; model effective listening



Some Suggestions

- To reduce test anxiety: minimize the impact of a single metric, use affirmation exercises
- To overcome implicit bias: grade anonymously, use rubrics, get backup for biases you've identified
- To broaden the students' views of who does science: strategically use diverse range of scientists in your examples; acknowledge historical bias
- To encourage equitable participation: use some of the in-class strategies we've demonstrated today; make participation regular and routine
- To foster respectful and productive group work; assign groups randomly; set expectations for group work; model effective listening
- To reveal our own commitment to diversity: talk about it; admit your own mistakes and vulnerability

What have we done?

- Throat vote
- Think pair share
- Multiple hands, multiple voices
- Randomized group selection
- “pick the person who...”
- Think/Ink
- Carousel
- One-minute paper (next up)

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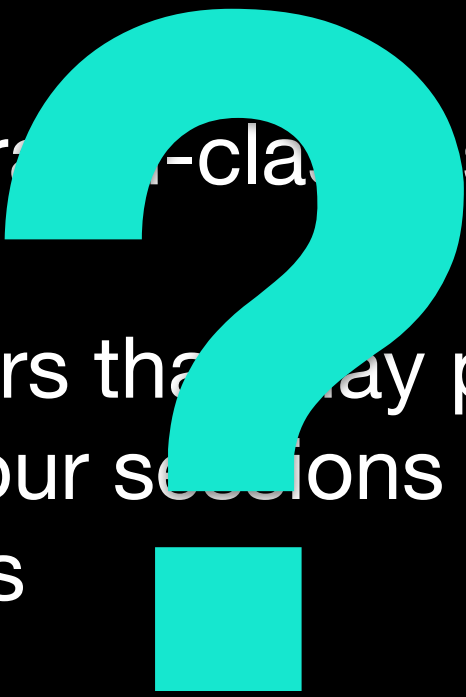
Many of these strategies are described in: Tanner, K. D. (2013). *Structure matters: Twenty-one teaching strategies to promote student engagement and cultivate classroom equity*. CBE Life Sciences Education, 12(3), 322–331. <https://doi.org/10.1187/cbe.13-06-0115>

**Please take 1-2 minutes to tell me,
anonymously and on the available
notecards, one new strategy you are
willing to try in your sessions, and why**

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