

Community, Collaboration, and Climate

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Department of Math & Stats
Pomona College
June 6, 2024



what we are



- enviable resources
- 8:1 student to faculty ratio
- strong students
- no graduate programs
- no engineering school



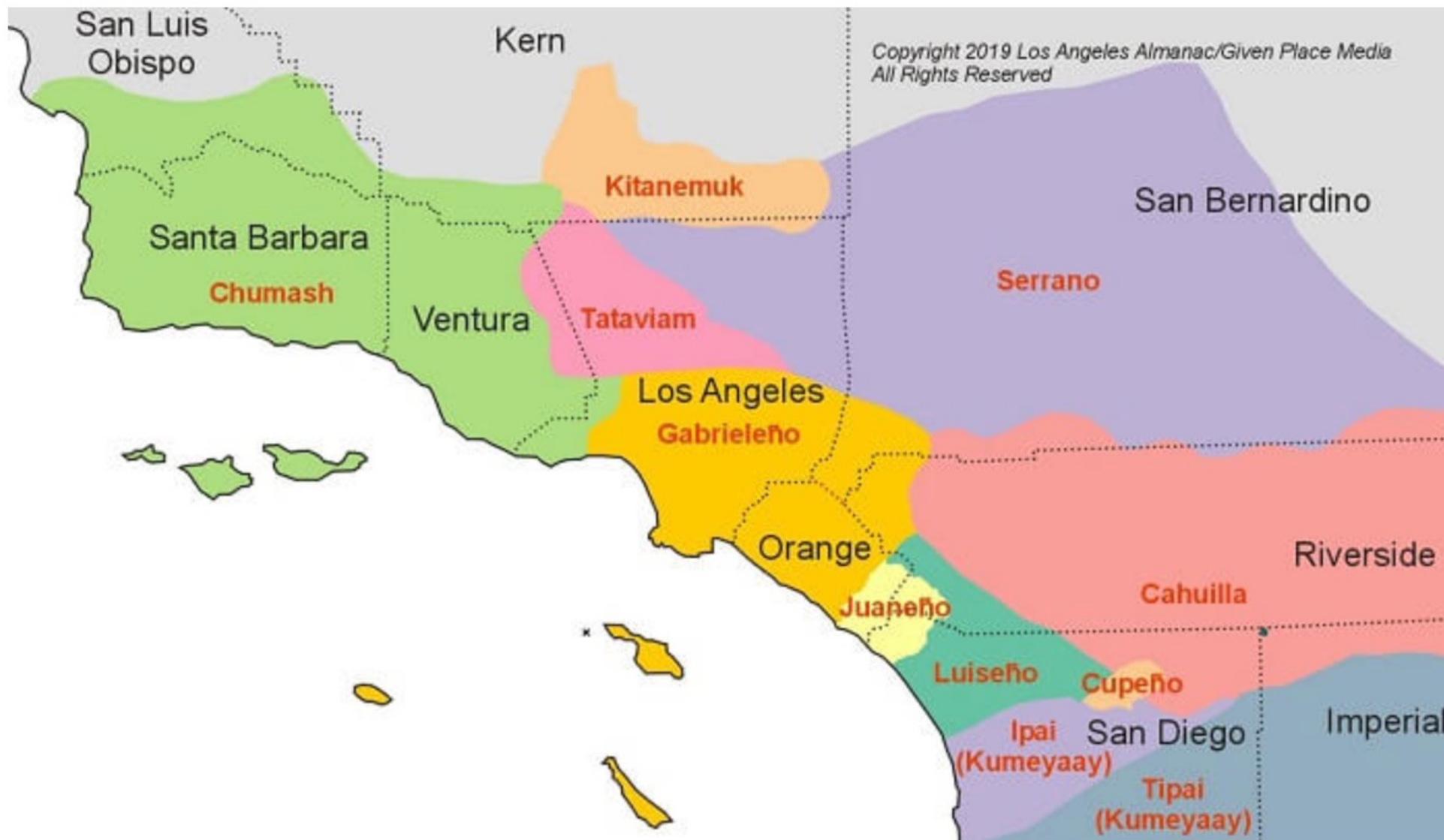
- expert in statistics education
- expert in assessment
- expert in diversity, equity, inclusion
- voice of my department



what I'm not

This land acknowledgment recognizes systemic and institutional systems of power that have oppressed Indigenous peoples, with many of the same systems in place today that continue to marginalize those with less power.

Original People of Los Angeles County



Map of territories of Original Peoples with county boundaries in Southern California, Los Angeles Almanac, 2019.

Information sources: *Handbook of North American Indians, Vol. 8, California*, William C. Sturtevant (Gen. Editor) & Robert F. Heizer (Vol. Editor), 1978, Smithsonian Institute, and Dr. E. Gary Stickel, Ph.D. (UCLA), Tribal Archeologist, Kizh Nation / Gabrieleno Band of Mission Indians.

image credit: <http://www.laalmanac.com/history/hi05.php>

Department of Mathematics & Statistics



Mindset

~30 years ago:

- to identify mathematical talent
- to encourage / train the talented to continue in Mathematics & Statistics

Department evolution



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Now:

- everyone can do math
- to facilitate success for *all students* in Mathematics & Statistics

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The problem

- Pomona had been consistently sending students to top graduate schools
- for a long stretch, we had approximately zero students of color majoring in Math & Stats



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The problem

- Our students of color, first generation college students, students from less privileged backgrounds, and women did poorly in our introductory classes
- Math acted as a barrier to courses in STEM across the college

Early on to broaden access
focused on student preparation
and the quality of their high school courses

- Emphasized Collaboration
- Created multiple pathways through the curriculum
- Introduced new courses
- Embraced active student learning



Early response

Early on to broaden access
focused on student preparation
and the quality of their high school courses



- Emphasized Collaboration
- Created multiple pathways through the curriculum
- Introduced new courses
- Embraced active student learning

- Enrollments increased and the major grew
- Lack of success with students of color persisted

Early response

- Pomona College admitted its first Posse cohort in 2005
- Five (of 11) math / stats profs have been Posse faculty mentors
- Started to take the work of Uri Treisman seriously



Change of perspective

- Pomona College admitted its first Posse cohort in 2005
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-
- Our focus shifted to the *Climate* in the Department
 - Spotlight moved from the students and their preparation...
 - ...to us, the faculty, and the environment in the department

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Change of perspective



Many students felt they did not belong
Hence, didn't use the available resources



To change the **Climate** & the environment, we implemented programs:

- individual classes
- department level
- college level

New approaches



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Organizing Theme: **Collaboration and Community**

Math & stats are social activities

To be successful, have to collaborate & build community

New approaches



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Organizing Theme: **Collaboration and Community**

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Not a magic bullet but some success

Hope is that sharing our concrete and modest steps is helpful

New approaches

Programs at Pomona



- 1-on-1 faculty-student advising
- Weekly group lunch meetings
- Within-course clusters
- Considerable faculty commitment
- Anti-deficit approach
 - whole person
 - build community
 - speakers / different paths



Pomona Scholars of
Mathematics

- Non-first-year PSM students
- Loosely organized, invite students to events
- Informal and formal mentorship of first-year students



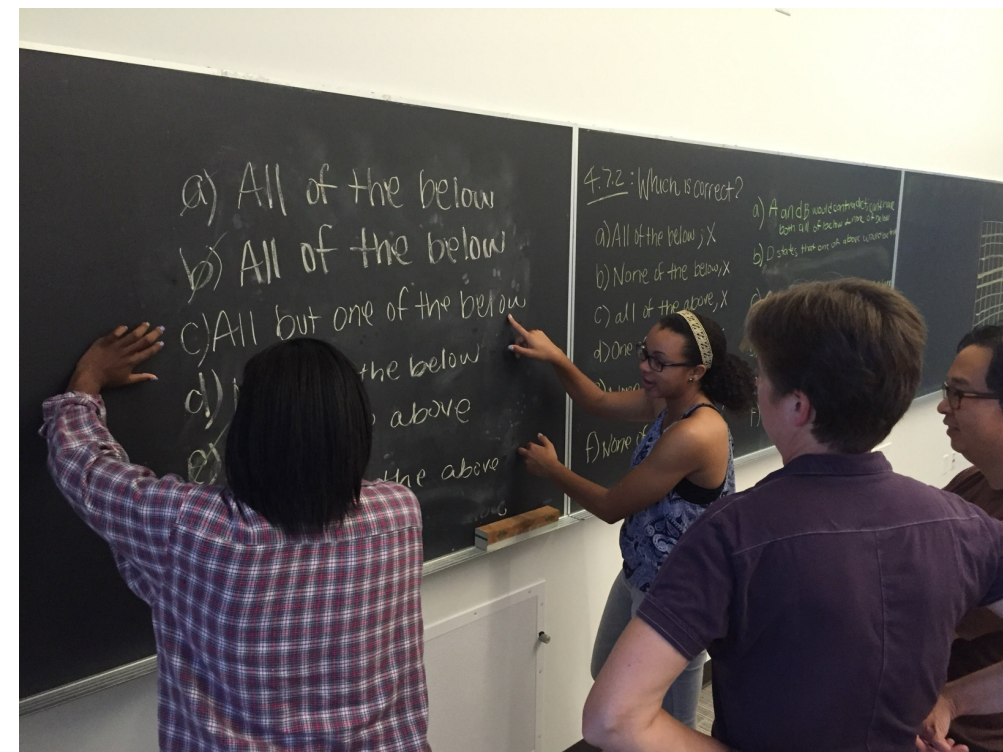
PSM+



- Class specific
- Targeted students → everyone
- “Older” student mentor
- Regular (“required”) meetings
- Low cost (both \$ and effort)
- Spread to upper div & other depts

Learning Communities

- Summer program for HS students
 - 4 weeks in residence
 - Commit to 3 years
 - Math + humanities courses
 - Workshops, HW, enrichment
 - Faculty profs + undergrad TAs
- Impact on our faculty
- Impact on our undergrads
- PAYS alumni attend Pomona



PAYS
(Pomona Academy of
Youth Success)

(started in 2002)

PRIMUS >

Problems, Resources, and Issues in Mathematics Undergraduate Studies
Volume 33, 2023 - Issue 5

154 0

Views CrossRef citations to date

2

Altmetric

Research Articles

Community, Collaboration, and Climate

Johanna Hardin   & Shahriar Shahriari 

Pages 445-462 | Published online: 29 Jun 2022

Shahriar Shahriari
sshahriari@pomona.edu

Reading more



My own classroom



CURV - connecting, uplifting, and recognizing voices

David Blackwell



David Blackwell

David Blackwell

Blackwell was the first black person to receive a PhD in statistics (from University of Illinois at Urbana-Champaign, in 1941 at the age of 22) in the US and the first black scholar to be admitted to the National Academy of Sciences. He was a statistician at UC Berkeley for more than 50 years. He was hired in 1954 after the department almost made him an offer in 1942 (but declined to do so when one faculty member's wife said she didn't want Blackwell hired because she wouldn't feel comfortable having faculty events in her home with a black man). Hear Blackwell tell the story [in his own words](#).

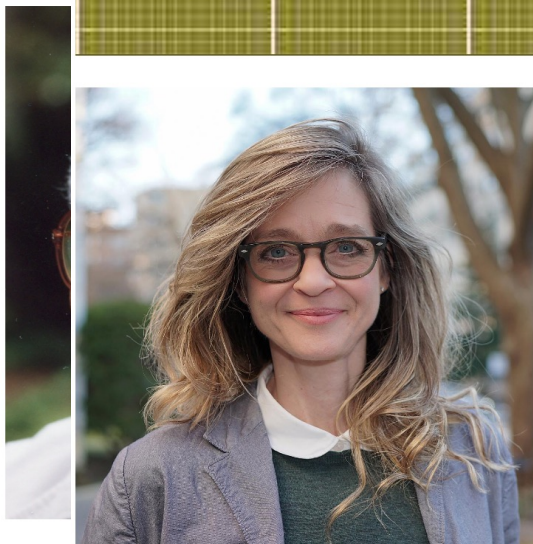
CURV

designed to introduce
statisticians & data
scientists in class

<https://hardin47.github.io/CURV/>

CURV - connecting, uplifting, and recognizing voices

Dr. Regina Nuzzo



David
Regina Nuzzo

Regina Nuzzo

Dr. Nuzzo received her PhD in Statistics from Stanford University and is now Professor of Science, Technology, & Mathematics at [Gallaudet University](#). Gallaudet University, federally funded and located in Washington, DC, is the only higher education institution where all programs are designed for the education of the deaf and hard of hearing. Dr. Nuzzo teaches statistics using American Sign Language.

She is the [Senior Advisor for Statistics Communication and Media Innovation at the American Statistical Association](#) and a freelance writer.

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David
Regina

Desi Small-Rodriguez



David
Regina Nuzzo



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Dr. Small-Rodriguez is a social demographer and an Assistant Professor of Sociology and American Indian Studies at UCLA. She received a PhD in Sociology from the University of Arizona and a PhD in Demography from the University of Waikato. Dr. Small-Rodriguez is Northern Cheyenne and Chicana and grounds her work in Indigenous studies, sociology of race and ethnicity, critical demography, and health policy research. She directs the Data Warriors Lab (a mobile data sovereignty lab serving Indigenous communities) and was previously a member of the [Collaboratory for Indigenous Data Governance](#). She is a founding member of the [Global Indigenous Data Alliance](#).

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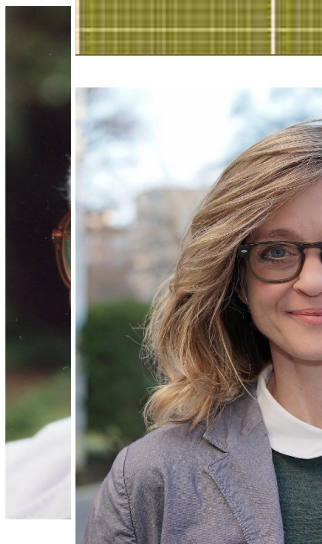
CURV - connecting, uplifting, and recognizing voices

Robert Santos

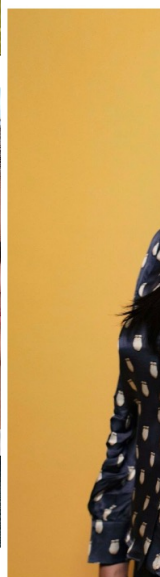
Desi

David

Regina



David
Regina Nuzzo



Desi Small



Robert Santos

Robert Santos

Robert Santos received an MA in Statistics from the University of Michigan, Ann Arbor. He served as president of the American Statistical Association in 2021. As a survey researcher, he worked at National Opinion Research Center (NORC, University of Chicago) and the Urban Institute in Washington, DC. From [wikipedia](#): The Urban Institute measures policy effects, compares options, shows which stakeholders get the most and least, tests conventional wisdom, reveals trends, and makes costs, benefits, and risks explicit.

As a Mexican-American, he is the first non-white person to serve as the Director of the US Census Bureau (appointed by Joe Biden and approved by the US Senate in 2022).

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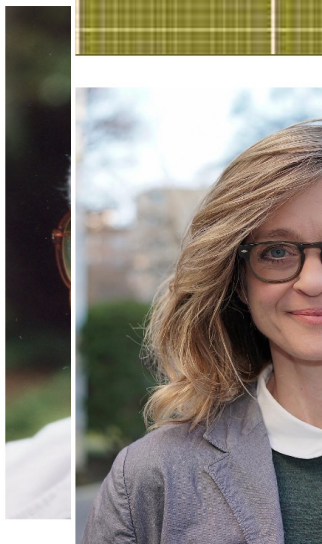
Robert Santos

Desi

David

Regina

Joy Buolamwini



David
Regina Nuzzo



Desi Small



Robert Santos



Joy Buolamwini

Joy Buolamwini

Dr. Buolamwini earned a BS in Computer Science from Georgia Institute of Technology, an Master's from University of Oxford, and MS and PhD (2022) degrees in Media Arts & Sciences from Massachusetts Institute of Technology. While a graduate student, Dr. Buolamwini was part of the [MIT Media Lab](#). Additionally, she is the founder of the [Algorithmic Justice League](#).

AS A MEXICAN AMERICAN, HE IS THE FIRST NONWHITE PERSON TO SERVE as the Director of the US Census Bureau (appointed by Joe Biden and approved by the US Senate in 2022).

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Resources for JEDI-Informed Teaching of Statistics

Pedagogy, research, and professional development

[Home](#) [Search](#) [Submit Content](#)

[Surprise Me!](#)

Common Searches

Professional Development

Examples

Classroom Activities

Pedagogy

Curriculum

Data

Search

Search

Spotlight

CAUSE Activity Winner: Culturally Responsive Teaching of Probability: Toma Todo and La Lotería

[Read more](#)

JEDI Topic

[Culturally Relevant](#)

[Probability](#)

ANALYZING HATE CRIMES STATISTICS

[Read more](#)

JEDI Topic

[Racial Discrimination](#)

Content Resource

[ANALYZING HATE CRIMES STATISTICS](#)

Statistics Topic

[Worksheet Activity](#)

JEDI-CAUSE

<https://causeweb.org/jedi/>

<https://www.causeweb.org/cause/ecots/ecots24>



Search for...

M13: Resources for JEDI-Informed Statistics Teaching

Monday, June 10th

3:35 pm – 4:25 pm E.T.

By Jennifer Ward, Jo Hardin, Tyler George, Jess Kunke

Information

Are you a statistics or data science instructor who is looking for a single website repository for educational resources related to Justice, Equity, Diversity, and Inclusion (JEDI)? Or do you use and/or create JEDI resources, and want to share how and what you use in your classrooms or research with others? The CAUSE Resources for JEDI-Informed Teaching of Statistics website offers materials such as classroom activities, curricular design, datasets, and professional development guidance to help all instructors incorporate more JEDI in their teaching and be more JEDI-Informed themselves. In this poster we will highlight some great examples that are currently on the CAUSE-JEDI website, provide guidance, and answer any questions about submitting JEDI materials that you have used and/or created for use in the statistics classroom.

JEDI-CAUSE

<https://causeweb.org/jedi/>

<https://www.causeweb.org/cause/ecots/ecots24>

The image shows a screenshot of a Microsoft Word document. The ribbon at the top includes 'Home', 'Insert', 'Draw', 'Design', 'Comments', 'Editing', and 'Share'. The document contains three numbered questions:


1. If 16 infants with **no genuine preference** choose 16 toys, what is the most likely number of “helping” toys that will be chosen?
(a) 4
(b) 7
(c) 8
(d) 9
(e) 10

2. How likely is it that exactly 8 helpers will be chosen (if there is no preference)?
(a) 0-15%
(b) 16-30%
(c) 31-49%
(d) 50%
(e) 51-100%

3. What if we flipped a coin 160 times?
What percent of the time will the

Clickers

Home Insert

Paste 



1. If 16 infants with **no genuine preference** choose 16 toys, what is the most likely number of “helping” toys that will be chosen?¹

- a. 4
- b. 7
- c. 8
- d. 9
- e. 10



5. what if we flipped a coin 100 times:
What percent of the time will the



- Slides
- Tools
- Close
- .reveal ol ol { list-style-type:...
- Clicker Q
- If 16 infants with...
- How likely is it...
- What if we flipped...
- Is our actual result...
- Based on the first...
- Based on the second...
- A possible confounding...
- The main reason we...
- The main reason we...
- Are there effects...
- Do people tend to...
- Does cell phone use...
- Do people consume...**
- Which is more effective:...
- Suppose that we record...

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5. what if
What perc

Clickers

AutoSave - S

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https://m58-intro-stats.netlify.app/clicker_study

Introduction to Biostatistics Syllabus Class Notes Project Clicker Q

Clicker Q

to go with *Introduction to Modern Statistics* by Çentinkaya-Rundel & Hardin. Math 58B - Introduction to Biostatistics.

1. If 16 infants with **no genuine preference** choose 16 toys, what is the most likely number of “helping” toys that will be chosen?¹
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 - a. 0-15%
 - b. 16-30%
 - c. 31-49%
 - d. 50%
 - e. 51-100%

3. What if we flipped a coin 160 times? What percent of the time will the simulation flip exactly 80 heads?³
 - a. 0-15%
 - b. 16-30%

Slides Tool

.reveal ol ol { list-styl

Clicker Q

If 16 infants with...

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1

2

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4

5

6

7

Clickers

Systemic Changes

- developed by a student mentor
- revised during a community seminar
- posted in every classroom in the department

GUIDELINES FOR MENTOR SESSIONS

MATH DEPT, POMONA COLLEGE

- **Collaborate**
 - Ask for help from another student before asking the mentor.
- **Listen**
 - Listen carefully to the ideas of your peers.
- **Language**
 - Avoid using words like “trivial”, “easy”, or “obvious”.
- **Names**
 - Learn everyone’s name. Remind people of your name, in case they forgot.
- **Prepare**
 - Attempt problems before the mentor session.
- **Participate**
 - Come to the mentor session even if you have a strong understanding, try to learn the material more deeply. Also, come to help your peers!
- **Process**
 - Work on scratch paper at the mentor session, re-write problems at home.
- **Balance**
 - Be aware of the space you are taking up. Recognize that the mentor is there to help all students, so try not to monopolize their time.
- **Ask**
 - Ask questions. Lots of them!
- **Mindfulness**
 - Help create a respectful and accepting environment.

Mentor Session Guidelines



My village

- Posse
- PRIME
- EDGE
- AWM
- 1-2-1 summer
bridge program
- (un) grading
- hiring



... and more

1. There is no silver bullet,
2. change takes time,
3. it is possible and necessary to make progress,
4. everyone plays a role,
5. but not everyone needs to be on board to start, and
6. no progress is permanent, you must keep reproducing it.





Thank you!

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