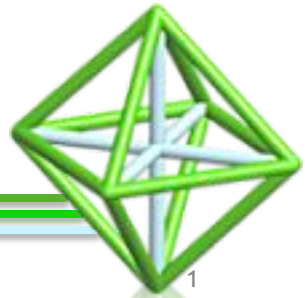
Reflecting on Practice: Mathematics and Motivation

Session 3

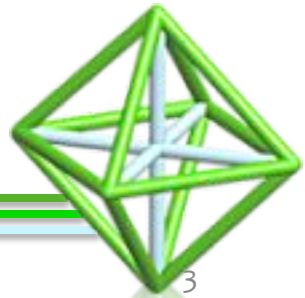
PCMI Outreach



Welcome Back!

Take a few minutes to introduce yourselves at your table- not only your name and where and what you teach but also-

- *What's your favorite math movie? OR*
- *What are you doing while you're grading papers?*

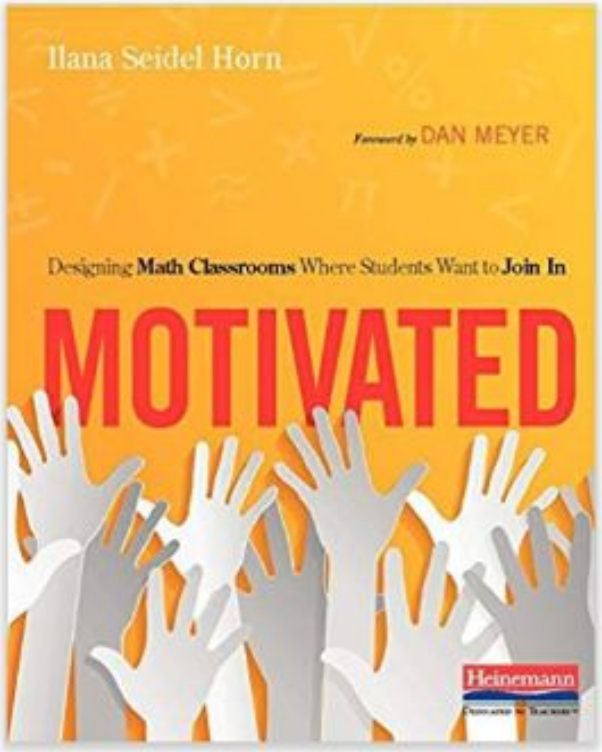


RoP: Student Motivation

Teachers will leave with a framework for thinking about motivation & strategies to help students want to engage with mathematics.

Specifically, we will focus on:

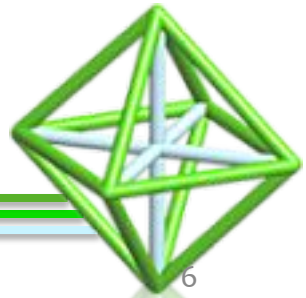
- Meaningfulness
- Belongingness
- Accountability




Belongingness
Autonomy
Meaningfulness
Motivational Classrooms
Accountability
Competence

Accountability

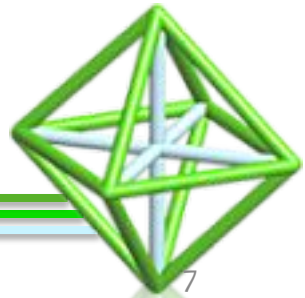
"Accountability refers to the structures and routines that oblige students to report, explain, or justify their activities. Often reduced simply to assessment, accountability goes beyond how we grade to **encompass the routines and norms that enjoin students to participate in particular ways in classroom life.** When students feel a sense of investment in and accountability to their classmates, for example, this changes the risk-benefit calculus, leveraging positive peer pressure to increase participation." (Horn, p. 8)



Norms of Participation

are about the expectations students and teachers have for the way class works:

1) everyone participates,
2) listening matters, and,
3) the focus is on mathematical ideas.



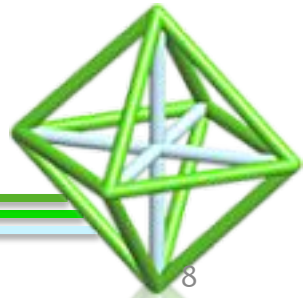
A Debate

The question is:

"Whose solution is the best and why?"

To prepare for your table's debate, spend a few minutes making observations about something you like about each solution

e.g. "I like that they made a table".



Debate Structure

At your tables, debate using the following structure:

Make a CLAIM and a WARRANT to support your claim

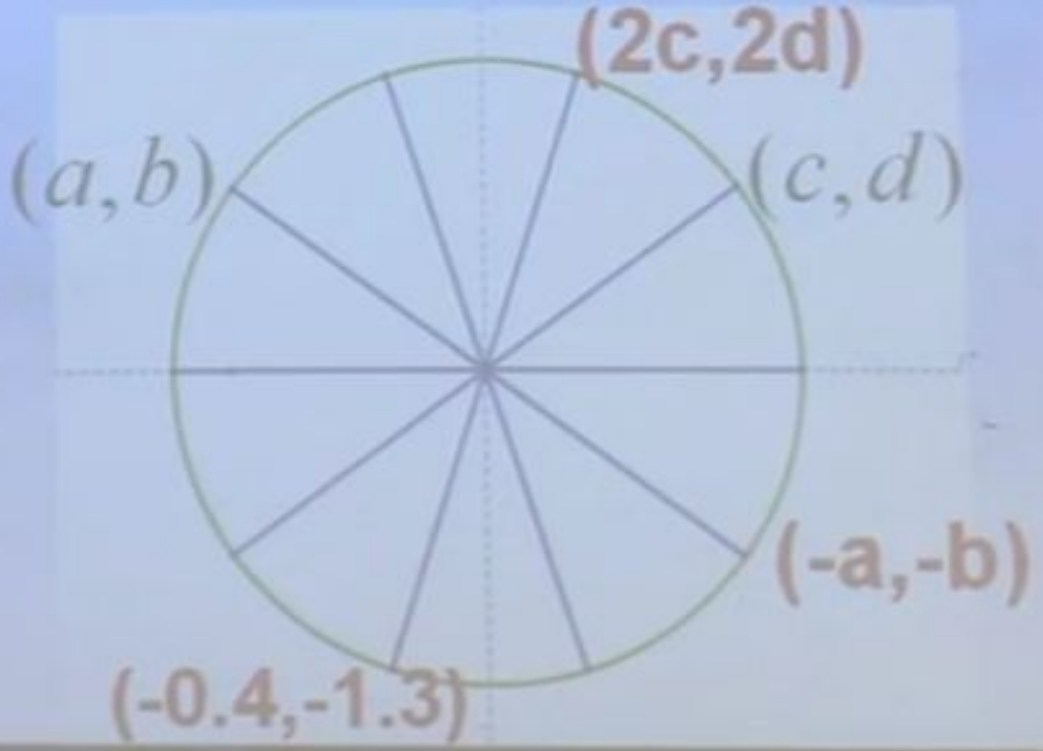
My CLAIM is _____,

and my WARRANT is _____,

April 11, 2013

Try NOW!

1. Ms. Smith drew a unit circle with new angle amounts. Can you label the angles?
2. The coordinates in black below were given (for some numbers a,b,c and d). Are her expressions for the coordinates in red correct?



Chris Luzniak (PCMI '10 & '11)

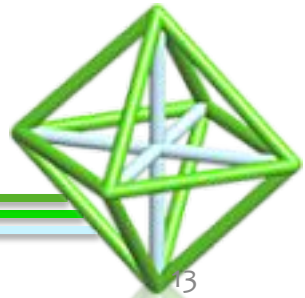
PBS Video

https://utah.pbslearningmedia.org/resource/mtc13.pd.math.deb/encouraging-debate#.W0aB69JKhPY

1. Write DEBATEABLE Questions

- Always / Sometimes / Never
- Agree / Somewhat Agree / Disagree
- Should
- Best/Worst (method, solution…)
- Biggest/Smallest
- Most
- Weirdest/Coolest
- Variables

Take a few minutes with your table group and talk about how this routine could encourage participation in your classroom.

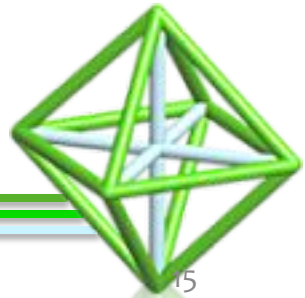


Solve the system

- $x + y = 10,\ y = x + 2$

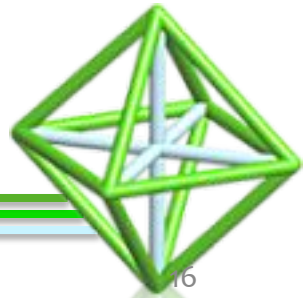
Solve the system

- $x + y = 10,\ y = x + 2$
- $x + y = 20,\ y = x + 2$



Solve the system

- $x + y = 10,\ y = x + 2$
- $x + y = 20,\ y = x + 2$
- $x + y = 20.5,\ y = x + 2$



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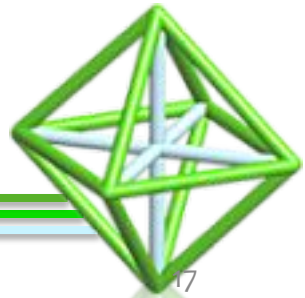
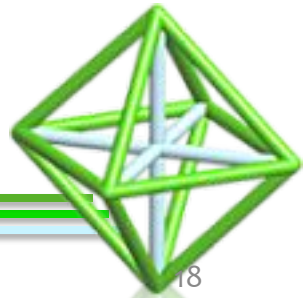


Smudged Ma[redacted]

Can this equation be true?

$$\left(\frac{[redacted]}{2}\right)^{[redacted]} = 2^6$$



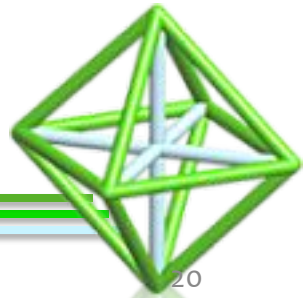
Norms of Participation

are about the expectations students and teachers have for the way class works:

1) everyone participates,
2) listening matters, and,
3) the focus is on mathematical ideas.

On your own

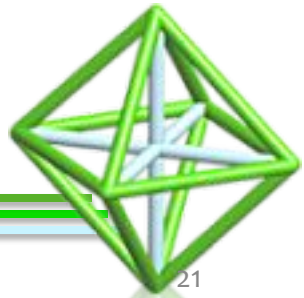
- Choose one or two of the problems on the handout.
- Solve it/them.
- If you have time remaining, think about an extension or how you might adapt these for your classroom



On the board

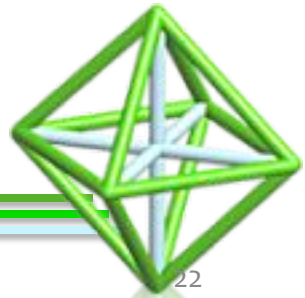
- Head to VNPSs!
- Share with your card-mates your solutions and/or extensions.

You'll be sharing one of the solutions/extensions you heard with a table partner in a few minutes



Back to the tables

- With a partner, back at your table, share at least one interesting thing someone else at your board presented

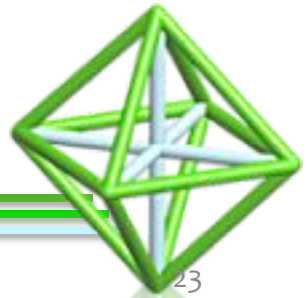


Smudged Math Debrief

How does having students use this routine of smudged math and/or active listening relate to accountability?

Norms of Participation:

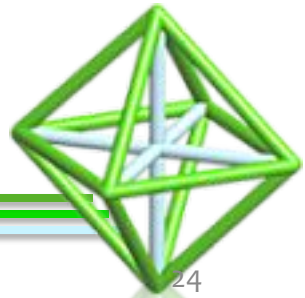
- everyone participates,
- everyone has to listen to how others thought about the problem, and
- the focus is on important mathematical ideas.



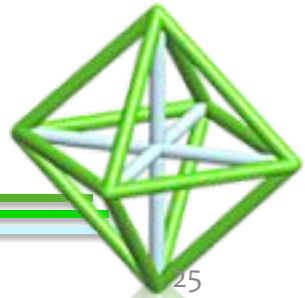
Reflection Question

What are the gaps between what you *say* you value and what students do?

What structures or routines can you incorporate that might help you teach them new ways of being in math class?



Thanks for a great weekend!



References

- Encouraging Debate. PBS Learning Media. https://ca.pbslearningmedia.org/resource/mtc13.pd.math.deb/encouraging-debate/#.W0aB69JKhPY
- Horn, L. (2017). *Motivated*. Portsmouth RI: Heinemann
- Luzniak, C. (2015). Debate Resources. https://www.luzniak.com/debate-resources.html