Creating a Motivating and Engaging Mathematics Classroom Climate

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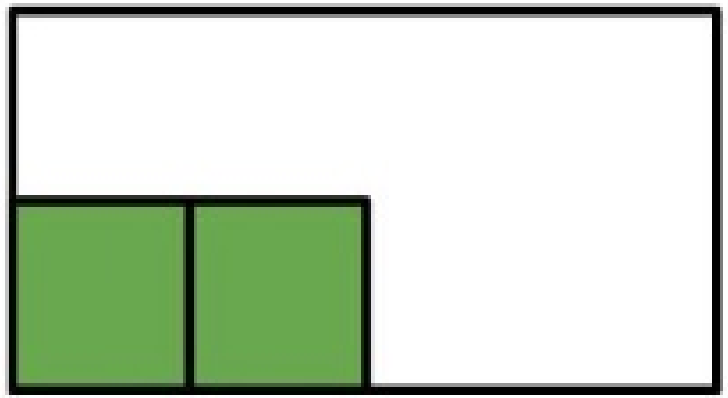
Agenda

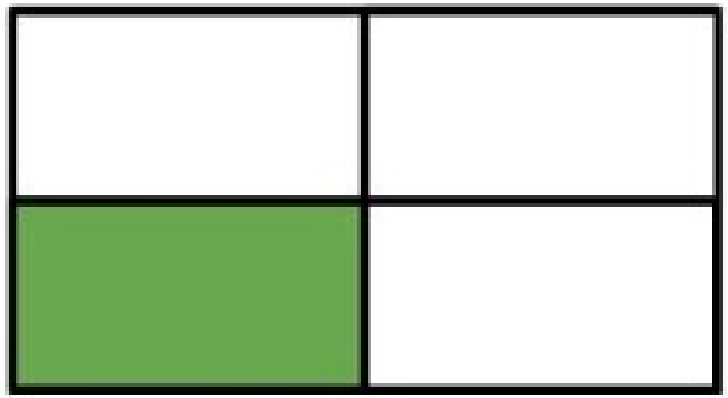
1. Let’s do math!
2. 5 elements of a motivating and engaging classroom climate
3. Rights of the Learner

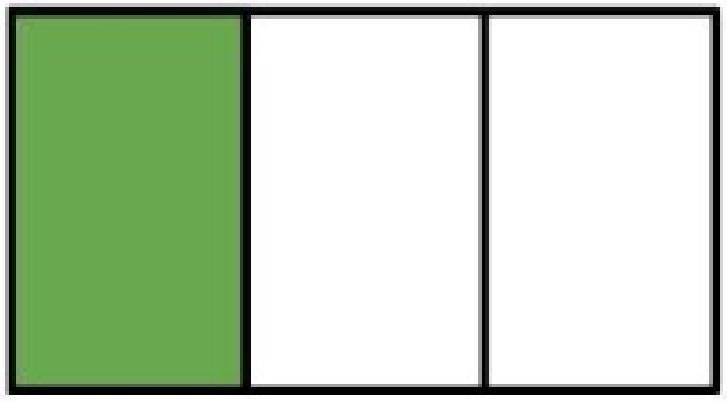
Which one doesn’t belong?

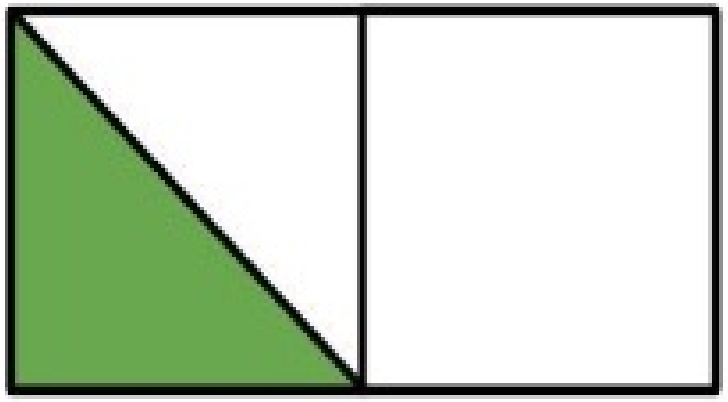
A mathematics instructional routine

- Look at all the options
- Which one doesn’t belong?
- Pair share
- Whole group share
- Reflect









Reflection Prompt

- A surprising way to think of why _____ didn't belong with the others was _____. This surprised me because _____.

Connections to Equity

- Every learner deserves the opportunity to engage in playful, creative mathematical thinking

- Task opens up options for many possible valuable contributions – opens up the space for more students to be positioned as competent

5 elements of a motivating and engaging classroom climate

5 elements of a motivating and engaging mathematics classroom climate

1. Climate of understanding
2. Climate of curiosity and relevance
3. Climate of challenge and support for challenge
4. Climate of active learning and student agency
5. A welcoming and warm classroom community

Connections to Equity

- Motivation is a problem located in classroom instruction, not a problem located in students
- All students deserve to have access to…
  - an engaging classroom environment that focuses on understanding
  - activates their curiosity and interest
  - challenges them (and supports them)
  - values their thinking
  - welcomes them

Rights of the Learner

Kalinec-Craig, C. (2016). Rights of the Learner: A framework for promoting equity through formative assessments in mathematics education. In Wood, M. B., Turner, E. E., Civil, M., & Eli, J. A. (Eds.). *Proceedings of the 38th annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education.* Tucson, AZ: The University of Arizona.

Creating Equitable Spaces to Engage All Learners

Rights of the Learner

1. You have the right to be confused
2. You have the right to make mistakes
3. You have the right to say what makes sense to you
4. You have the right to write what makes sense to you

- Crystal Kalinec-Craig, University of Texas, San Antonio

Creating Equitable Spaces to Engage All Learners

Rights of the Learner

- Honor and make explicit that learning is a process of trying on ideas
- Accept and embrace students *as they are* while supporting them to grow
- Offer teachers access to students' thinking (formative assessment)

Right of the Learner #1: right to be confused

RotL #1: right to be confused

- Normalize this right during instruction with challenging, group worthy tasks
- Working through uncertainties leads to new connections and understandings
- Productive struggle is a normal part of sense-making

RotL #1: right to be confused

“If learning mathematics is a civil right, then *all* children should also have the right to be confused or productively struggle in the process of that learning.”

- Crystal Kalenic-Craig

Right of the Learner #2: right to make mistakes

RotL #2: right to make mistakes

- Do not cover up mistakes, but use them constructively to learn mathematics through analyzing mistakes.
- Mistakes can be opportunities to raise everyone’s understanding.

Right of the Learner #3: right to say what makes sense to you

RotL #3: right to say what makes sense to you

- Honor the language that students use to communicate their thinking.
- Build on students' informal language to transition to more formal language.
- Never say anything a kid can say.

RotL #3: right to say what makes sense to you

Particularly important for

emerging English speakers:

“By resisting a deficit perspective of all children, teachers and schools should recognize that all children, no matter their native language, bring a wealth of knowledge, experiences, and skills that can help them learn content being taught in schools.”

- Crystal Kalenic-Craig

Right of the Learner #3: right to write what makes sense to you

RotL #3: right to write what makes sense to you

- Honor the ways students record and communicate their mathematical thinking through words, symbols, pictures on paper.
- Build on students' informal recording to transition to more formal representations.

RotL #3: right to say what makes sense to you

“Even if teachers are unfamiliar with how a student is recording their thinking, they need to be prepared to recognize and validate students’ mathematical thinking, especially as it is connected to their language and culture.”

- Crystal Kalinec-Craig

Rights of the Learner

- We can learn to see and appreciate students enacting their rights.
- We can promote, encourage, and welcome students' opportunities to enact these rights.
- Provide students with opportunities to further learn how to enact their rights.

Rights of the Learner

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What rights do we want to advocate for our learners?

DIRECTIONS: What rights do we want to advocate for our learners?

- In groups – create, edit, revise a set of rights of learners
- Start with these four as inspiration
- Create your own set of rights
- Responsibilities that correspond?

- Facilitator: Keep everyone on task
- Recorder & Materials Manager: Make sure everyone is writing down ideas & has supplies
- Includer: Be sure people feel heard and understood
- Questioner: Play role of skeptic and clarifier

Rights of the Learner: One revision

1. the right to be confused,
2. the right to make a mistake,
3. the right to do and represent only what makes sense (which includes written work)
4. the right to engage in conversations, ask questions, share ideas, and listen to the thinking of others
5. the right to have a safe space to take risks

Moving forward

- Value our students:
  - Double down on our commitment to embrace, honor, and listen to our students.

- Value each other:
  - Work together to help one another see strengths in our teaching that we can build upon as we continue to grow.

I used to think…

Now I think….

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Some Possible Motivations

Held by students during mathematics classes

Engagement Structures	Motivating Desires
Get the job done I'm Really Into This	Complete or fully experience mathematical activity
Look at How Smart I Am Check This Out Let Me Teach You	Demonstrate competence, obtain external payoff, help others understand or solve
Don't Disrespect me It's Not Fair	Defend oneself, address perceived inequities
Stay out of Trouble Psuedo-Engagement	Avoid interactions that lead to conflict or being noticed
Help Me Value Me	Be noticed, cared for, obtain support

Goldin, G.A., Epstein, Y.M., Schorr, R.Y., & Warner, L.B. (2011). Beliefs and engagement structures: Behind the affective dimension of mathematical learning, *ZDM*, *43*(4), 547-560.

Climate of UNDERSTANDING

Mathematics classrooms are motivating and engaging…

…when mathematics makes sense and when students believe that they are capable of making sense of mathematics (Boaler, 2015; Cohen & Lotan, 1995, Hiebert et al., 1997; Midgley et al., 1998; Seeley, 2009).

Students have higher confidence and focus more on learning than performing or competing.

Climate of CURIOSITY AND RELEVANCE

Mathematics classrooms are motivating and engaging…

…when the mathematics and situations in which the mathematics is set are interesting to students (Hidi & Renninger, 2006).

Students' interests and senses of wonder are activated. This leads to greater effort, which yields success and greater connection to the subject matter.

Climate of CHALLENGE and SUPPORT

Mathematics classrooms are motivating and engaging…

…when students are asked to take intellectual risks and feel safe and supported to take them (Stein, Grover, & Henningsen, 1996; Thanheiser & Jansen, 2016; Steuer, Rosentritt-Brunn, & Dresel, 2013)

When students perceive that they are being supported, they will be more likely to persevere and be more willing to approach future challenges.

Climate of ACTIVE LEARNING and AGENCY

Mathematics classrooms are motivating and engaging…

…when effort and understanding are promoted over a performance culture or over competition because students' ideas are central to mathematics instruction (Blackwell, Trzeniewski, & Dweck, 2007; Kazemi & Stipek, 2001).

Students have higher confidence if their mathematical ways of thinking ideas are valued, and they focus on learning over performing or competing.

A warm and welcoming classroom community

Mathematics classrooms are motivating and engaging…

…when students feel that they matter – as people – to their teacher and their peers (Cohen & Lotan, 1995; Turner, Meyer, Midgley, & Patrick, 2003).

When ALL students feel a sense of belonging, they feel welcome, emotionally safe to take intellectual risks, open to learning from one another, put forth more effort, all which lead to understanding.

What do these elements of a motivating and engaging classroom climate look like?

DIRECTIONS: What do these elements of a motivating and engaging classroom climate look like?

- In groups – elaborate upon descriptions of teaching that could lead to developing such a climate
- Use descriptions of teaching as an inspiration
- Create your own descriptions

- Facilitator: Keep everyone on task
- Recorder & Materials Manager: Make sure everyone is writing down ideas & has supplies
- Includer: Be sure people feel heard and understood
- Questioner: Play role of skeptic and clarifier