

#INspirEDmath

December 2019, Volume 16

We hope this finds you on your way to a couple weeks of family time and traditions. You deserve those things and more! This is also a great time to reflect upon 2019 while looking forward to 2020. For the math specialists at Indiana's Department of Education, we look forward to continued work with our incredible Hoosier educators, to hosting and participating in our first book study (sign up below), and to providing even more supports via the [Math Framework](#). What about you? How can we help? Click the button below to let us know.



[How can we help?](#)

"The Most Powerful Student Motivator is Curiosity."

Rich Learning with Dan Finkel | Part 2: Lighting Student Curiosity



Problem of the Month

Secondary Problem of the Month

Joel and Marisa are running for president at their middle school (grades 6-8). After the votes are in, Joel and Marisa are each convinced that they have won the election:

- Joel argues that he has won a larger percentage of the overall vote than Marisa so he should be the new president.
- Marisa argues that she has won a larger percentage than Joel of the 6th grade vote and the 7th grade vote. Since the majority of the grades voted for her, she should be the new president.

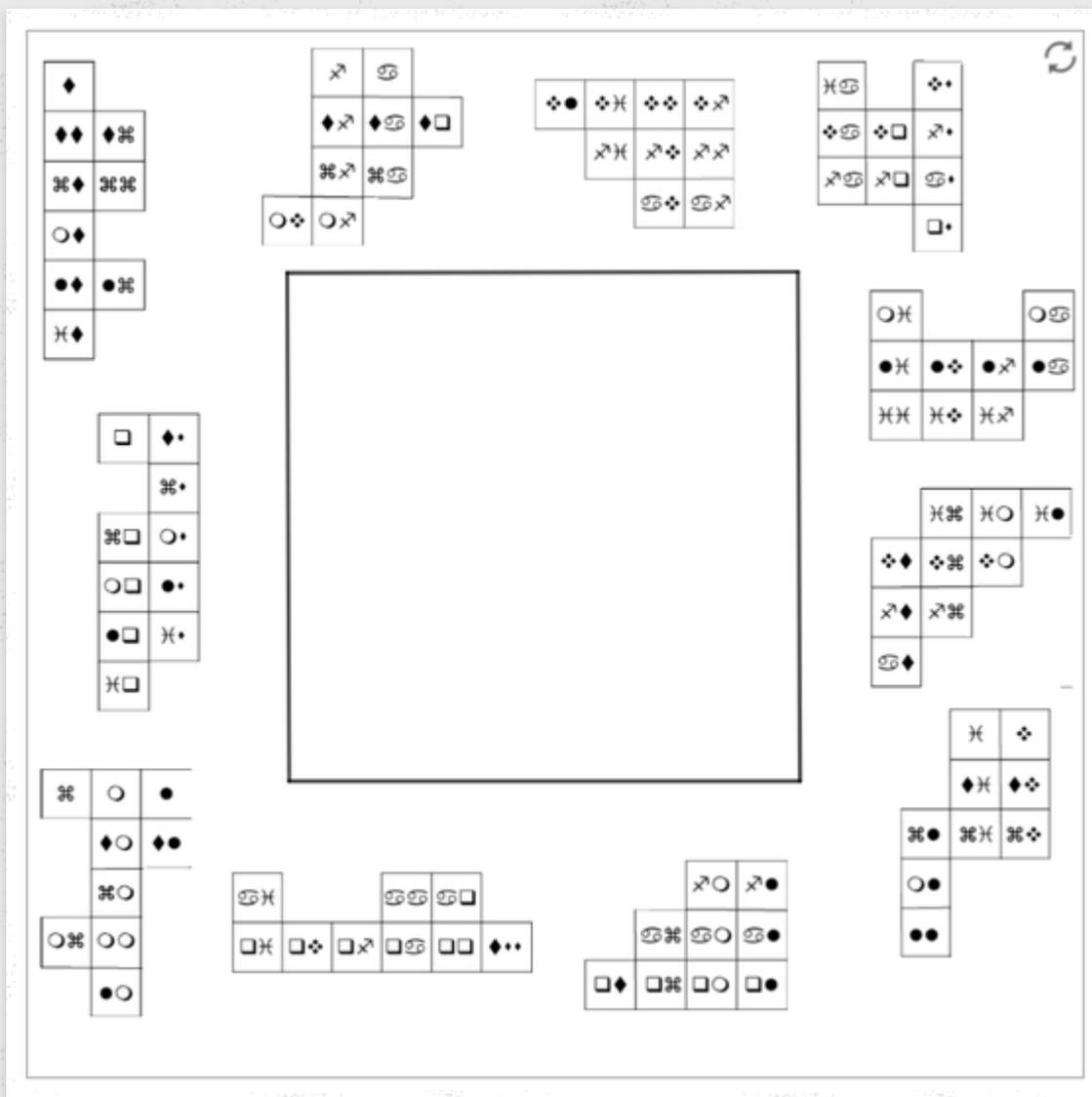
Is it possible that both Joel and Marisa are making accurate claims? Explain.



Find the [solution](#) to this task here.

Elementary Problem of the Month

Coded Hundred Square - This hundred square is written in code. It starts with one and ends with one hundred.



Can you build it?

How did you do it?

Can you build it in a different way?

Talk to a partner who has also tried building the hundred square. How did he/she do it?

What do you like about his/her method?

Click [here](#) for an interactive digital version.

Click [here](#) for a printable version.

The Indiana Process Standards for Math

The process standards are at the heart of effective teaching. They are what grounds good instruction. This month, we focus on practice two.

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
- 3. Construct viable arguments and critique the reasoning of others.**
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

More Than Adding "Explain Your Answer"

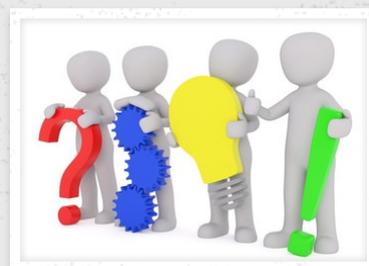
Although adding an explanation or justification aspect to a problem does put students on a path towards constructing viable arguments, it is not enough. Doing that alone will not help them develop the skills to learn *how* to develop an argument. Learning how involves evaluating evidence, asking appropriate questions to gather information, and analyzing that information to inform their argument.

Here are a few more skills we can support our students with:

- Use prior results to develop arguments
- Provide counterexamples
- Justify conclusions
- Identify and explain errors in arguments
- Using questions to clarify the reasoning
- Comparing multiple arguments
- Effective communication

Your Questions Matter

As you work with your students on content standards, remember that the process standards are embedded naturally in your lessons each day when utilizing NCTM's eight effective teaching practices. You can help your students develop the skills necessary to construct viable arguments and effectively critique the reasoning of others by paying attention to the types of questions you ask them (NCTM practice of posing purposeful questions). Some of these questions may include:



- Tell me what your answer means.
- How do you know your answer is correct?
- If I told you I think the answer should be [*offer a wrong answer*], how would you explain to me why I am incorrect?
- Which of the following arguments do you believe is correct or most effective?

Implementing in the Classroom

Throughout the third math process standard, students are learning to support their thinking with evidence. As mathematicians, they can justify their solutions and communicate their thinking to others. Students need a sufficient amount of time observing teacher modeling, practicing, and talking with other mathematicians to become proficient. Try out the **5 Talk Moves** to initiate and model student conversations.

1. Re-voice

"So you're saying that it's an odd number?"

This talk move allows teachers and students to interact with a student who may be unclear.

2. Restate

"Can you repeat what he/she said in your own words?"

This talk move will extend the responsibility to all students in the classroom. We can teach them the significance of learning from one another.

3. Agree/Disagree

"Do you agree or disagree and why?"

This talk move encourages students to apply their own reasoning to someone else and pushes students to support their ideas with evidence.

4. Add On

"What can you add to this idea?"

This talk move increases conversations amongst students and goes beyond the agree/disagree discussion.

5. Wait Time

(10 seconds) *It's longer than you think!*

This talk move is all about giving every student the chance to think about their ideas and apply them.

For more information click [here](#).

For student talk moves click [here](#).

Construct viable arguments and critique the reasoning of others. Mathematical Practice 3



I can make conjectures and critique the mathematical thinking of others.

I can **make, justify (prove), and present** arguments by...

- using objects, drawings, diagrams and actions
- using examples and non-examples
- applying context

I can **critique the reasoning of others** by...

- listening
- asking questions to clarify or improve arguments
- comparing strategies and arguments while identifying flawed logic

Resources to Support Our Students in Critiqueing the Reasoning of Others



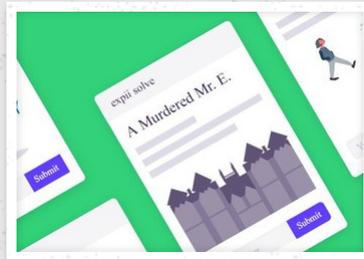
Always, Sometimes, Never

Step 1: Choose a topic.

Step 2: Have students categorize statements as always true, sometimes true, or never true.

Step 3: Students must justify/defend their work using examples and explanations.

Click [here](#) for topics and activities!



Expil Solve Puzzles

Fun, thought-provoking, interactive math puzzles shown through current events and pop culture designed to relate to your life.

Click [here](#) to challenge your students!

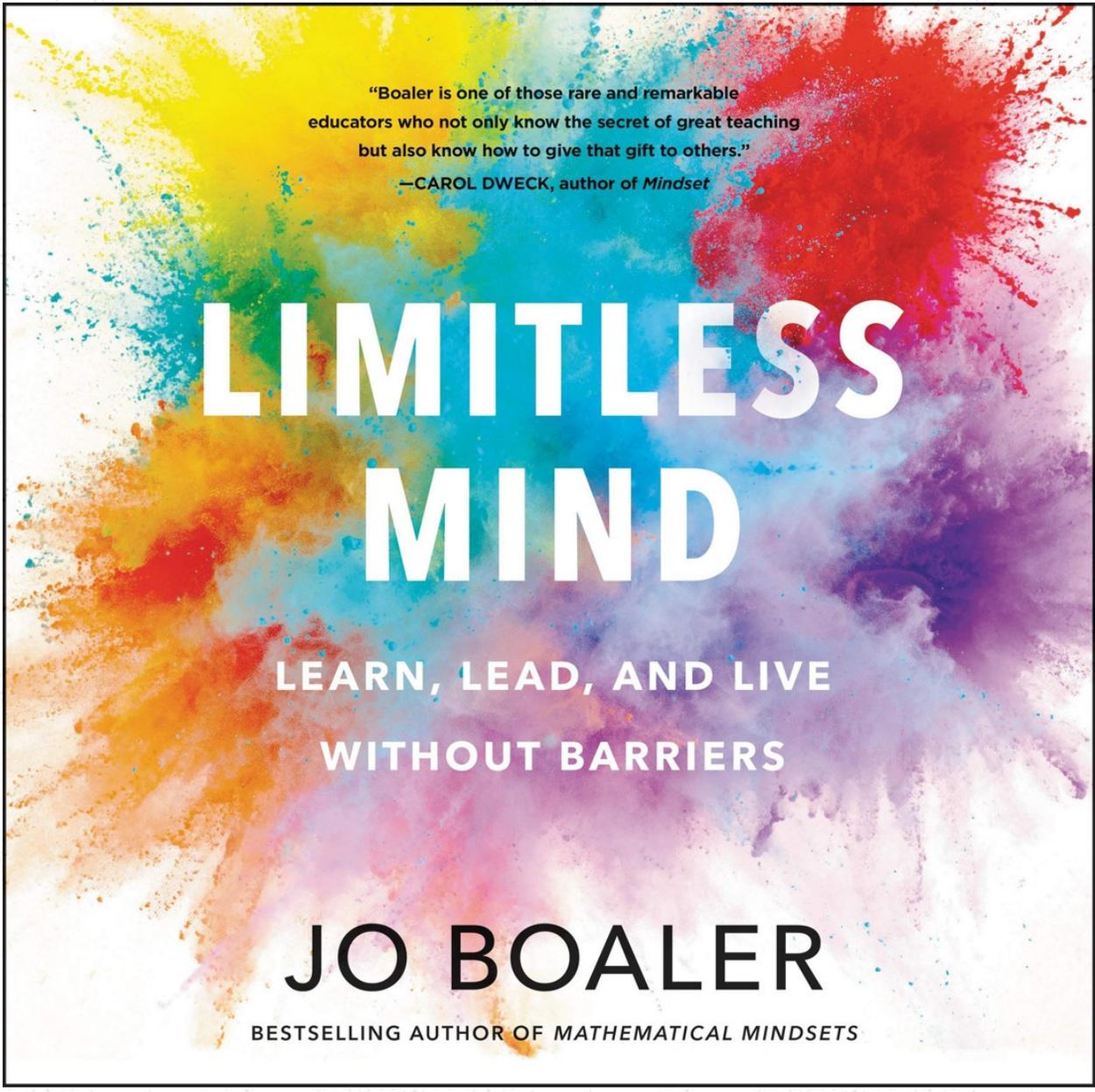


Illustrative Mathematics

A space for learners to know, use, and enjoy mathematics. These tasks help students at all grade levels to listen to or read arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

Click [here](#) to find illustrations for each grade level.

Opportunities for the Field



“Boaler is one of those rare and remarkable educators who not only know the secret of great teaching but also know how to give that gift to others.”

—CAROL DWECK, author of *Mindset*

LIMITLESS MIND

LEARN, LEAD, AND LIVE
WITHOUT BARRIERS

JO BOALER

BESTSELLING AUTHOR OF *MATHEMATICAL MINDSETS*

FREE #INspirEDmath Book Study!

We will be exploring best-selling author Jo Boaler’s *Limitless Mind: Learn, Lead, and Live without Barriers* and its impact on teaching and learning. IDOE’s math specialists have planned interactive and engaging discussions with opportunities to stretch your boundaries and apply your learning.

We will meet virtually for eight weeks. All participants are responsible for purchasing the book. New reading and reflections will be posted every other week in a self-paced format (see dates below). Our final meeting will be an in-person workshop to allow for deeper discussion surrounding ties to personal and professional experiences and implications for teaching and learning. Participants will earn 10 PGPs for full participation and attendance at the final meeting.

- January 9
- January 23
- February 6
- February 20
- March 5 - In-person workshop - Innovation Center - Greenwood, IN - 9 a.m. – 2 p.m. ET

[Click here to sign up today!](#)

Spring Analytical Algebra II Learning and Collaboration

Join Robin Conti from IDOE for a full day of PD surrounding the new Analytical Algebra II course. Participants will:

- Participate in model lessons
- Discuss resources/strategies
- Develop activities collaboratively
- Continue to build out community

Click on one of the dates below for registration and details!

[February 3](#) - Jasper, IN

[February 11](#) - Warsaw, IN

[February 12](#) - Indianapolis, IN



Fifth-Annual Indiana STEM Education Conference

Registration is open for the Indiana STEM Education Conference. It will be held at Purdue University in West Lafayette on Wednesday, January 15, 2020. The conference will have new features addressing the STEM education needs of K-12 teachers and schools. This year's theme will focus on Indiana's STEM Education Strategic Plan. An afternoon professional development workshop to help you earn workforce-related hours will be offered.



The cost for the registration is \$95 if you register by Friday, December 20, and \$110 if you register after December 20. The conference is an opportunity for STEM teachers and STEM schools to present effective lessons, policies, partnerships, assessments, and STEM education strategies. Register [here](#).

New Experiences for Instructors of Dual Enrollment (NExIDE) Scholarship Program

The purpose of the NExIDE Scholarship program is to provide financial support and incentives to eligible Indiana public high school mathematics teachers who teach or plan to teach dual credit mathematics. Based on expectations from the Higher Learning Commission, college faculty are required to have completed a master's degree in their discipline or to have completed a master's degree in another field with 18 hours of graduate credit in their discipline. This requirement includes dual credit teachers who teach college classes in the high school setting.

Click [here](#) for more information and access to the application!

Indiana's Second Annual Educating the Whole Child Summit



Registration can be found [here](#). Please note that if you are having one person register a group of people for your district, they will have to submit separate registrations by leaving and re-entering registration.

Highlights from just a few of the keynote speakers:

[Dr. Isaiah Pickens:](#)

[Dr. Adam Saenz](#)

Click [here](#) for the Handle with Care presentation

Blocks of rooms have been secured at the Marriott East for \$129/night. For your planning purposes, please know each day will begin with breakfast/registration beginning at 7:30 a.m. Day one, February 19, will begin with a speaker at 9:00 a.m. and Day two, February 20, will begin at 8:30 a.m. Both days will end at 4:00 p.m.

Questions should be directed to Christy Gauss at jcgauss@indiana.edu.

Save the Date



Upcoming Chats:

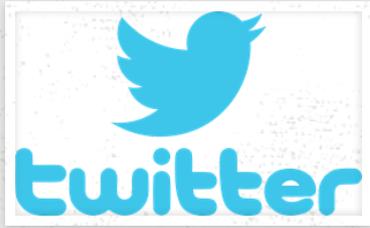
December 18, 2019 - Securing Supports for Students with Dyslexia

January 8, 2020 - English Language Learners

January 15, 2020 - Role of an Instructional Leader for Principals

January 22, 2020 - Is Math Big, Hairy, and Scary? Debunking Mathematical Myths

Twitter 101



New to Twitter?

Twitter is one of the most popular social networks in the world. A growing number of educators are using Twitter as a quick, easy, low-cost alternative to traditional conferences. Joining Twitter is simple but there are a few tips worth knowing to get your account set up just right.

Check out this [article](#) to learn more.

New to Chats?

Want to connect and build a professional learning community?

Want to collaborate, share ideas, and problem-solve with your peers?

Want to start curating a toolbox of resources?

Check out [this resource](#) to join the conversation!

Ready for More?

Twitter is incredibly useful for teachers. Used properly, Twitter helps you find the latest and greatest teaching ideas and resources. If you're ready for more, host your own Twitter Chat with your school community!

For planning help, check [this](#) out!

News From Assessmet

The Office of Student Assessment has released a consolidated list of which standards in grades 6, 7, and 8 will be assessed during the non-calculator section of the ILEARN assessment. This designation is based on a determination by educators that calculator usage on items written to these standards would inhibit the ability to assess the focal aspect of the mathematical construct.

<https://www.doe.in.gov/sites/default/files/assessment/illearn-noncalcstandards.pdf>

Beginning with the Winter 2019 Retest, the ISTEP+ assessment will be delivered in the same online system that is used for ILEARN and I AM. For online test sessions that allow calculator use, students may use the online Desmos graphing calculator or a handheld calculator. For paper test sessions that allow calculator use, students may use a handheld calculator.

TAs must oversee the use of the handheld calculator to ensure use only during appropriate test segments. Misuse of a calculator may result in a test invalidation for an assessment needed by a student to fulfill graduation requirements. Handheld calculators must meet the functionality requirements, as outlined in the full Calculator Policy:

<https://www.doe.in.gov/sites/default/files/assessment/calculator-policy2019-2020-final.pdf>

Math Educator Spotlight

Kristina Miller - South Adams High School

Nominated by: Stephanie Shane

School Corporation: South Adams Schools

Catchphrase: "Ladies and gentleman can I have your attention."



Mrs. Miller has been teaching for over 30 years and is a great example of what teaching with heart means. Not only is she excellent in her field, but she has one of the kindest hearts you will ever find. She gets to know her kids not only on an educational level, but their interests, sports, activities, etc. She spends a portion of her Monday morning letting her students share something about their weekend or an activity that they participated in. As a facilitator in her classroom I have been blessed to witness her interaction with students and how she makes learning Algebra fun. Mrs. Miller has touched so many lives with her teaching skills, her attention to detail, understanding the problems that her students are facing, and acknowledging their strengths and weaknesses in the classroom. I wish everyone had the opportunity to sit in her classroom for one period to see her style of teaching! We could all learn from Tina - I tell her all the time how awesome she is. She always replies, "I'm so lucky to have you in here" she is as humble as they come. This in and of itself is a characteristic many could learn from. In an age where people are boastful and like to state their importance with titles and degrees, she is very happy to give credit to those around her and humbly plays down the fact that she has a brilliant mind. I am so happy to nominate her and I hope others are inspired by Mrs. Miller!

Mathematics Educator Spotlight Nomination

We are looking for rock star math educators who are innovative and inspiring; educators who lead, learn, and collaborate with humility and passion. If you know someone (or are that someone) click the button and nominate them (or yourself)!

Your IDOE Mathematics Team



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