



WHY USE AN INQUIRY-BASED APPROACH IN MATH CLASS?



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The first time I taught a college-level class, it was an online Critical Thinking course. I learned a lot that term- and I made a lot of mistakes. When the term started, I thought I had it all together. I had the perfect textbook, a super tight syllabus, meticulously edited video lectures, and so, so many answers. Holding a newly minted master's degree, I was excited to give my students all the answers. That's my role, right?

It didn't take long for me to quickly learn that "do it like me" instruction wasn't working for ANY of us. It didn't take long for me to put it together that they were regurgitating my answers and my thinking. I was reading papers that were parroting back what I was saying. Now, the concern here wasn't plagiarism. The concern was that students were not given the opportunity to get messy with their own understanding. I had not created an environment where THEIR thinking and experiences were central to the learning. What a missed opportunity for me to help them find and build their own understanding!

That missed opportunity sparked a shift. Fast forward 8 years and 65 courses taught, and my approach is far different. I now primarily teach social justice courses and I lean heavily on an inquiry-based approach.

I ask my students:

- What has shaped your understanding of social justice?
- How do you know when something is equitable or inequitable?
- How do you know when something is just?
- Why do you think we are spending time investigating this?
- Why do you think that?



Questions that tap into metacognition help to build and solidify their understanding. This is true regardless of the subject or discipline being taught. The questions that I ask and how I ask them are critical for them to take the lead in their own sense-making.

I was talking to another new college instructor about an inquiry-based approach and he said “Well, yeah, but that doesn’t work with things like math.” Little did he know that while not a math teacher myself, I work with over a dozen math teachers at All Learners Network (ALN). And you better believe that inquiry-based instruction not only works in math class - it is paramount to nurturing mathematical understanding.

This idea that increasing question asking and decreasing answer providing doesn’t work in math is fairly common and it is also completely untrue. Now- is the inverse frequently practiced? Of course- many of us learned math that way and have even taught math that exact way. Are there other ways to teach that center a student’s mathematical understanding over their ability to memorize or mimic? Absolutely.

The Gradual Release of Responsibility Model, commonly known as “I do, we do, you do,” emphasizes mimicking the teacher’s mathematical thinking instead of focusing on developing students’ conceptual understanding. Rather than repeating a teacher’s thinking, we want to allow students to practice and develop their mathematical thinking. When we start with student thinking, we are honoring the strengths and experiences that every student brings to the learning community. The “I do, we do, you do” model reinforces the teacher as the keeper of the knowledge. For ALL students to learn math well, they need to see themselves as the capable mathematicians that they are. They need opportunities to think, struggle, share, and compare their ideas with others.

What are ways to easily incorporate an inquiry-based approach into your math class?

- Utilize Three Act Tasks as a way to open up conversation, since by design, they flip the Gradual Release of Responsibility Model on its head by centering student thinking, question asking, and collaboration. Check out some here:
 - K-5 Three Act Tasks
 - K-8 Three Act Tasks
 - High School Three Act Tasks
- The ALN Problem Introduction Protocol centers student sense-making by allowing students to collectively examine a task as they are led through strategic questions about the task - in order to help them solve it.
- Implement strong Closures in math lessons as a way to create an environment where students are solidifying and sharing their own learning.

Question asking is a skill that educators need to be able to hone and practice. By crafting strategic questions, we can help center a student’s learning and create



opportunities where they are not just solving a solution in the moment - but building life-long understanding.



The eager graduate, excited to get her graduate degree and start teaching college courses- had no idea the lessons she was about to learn.

What Now? Scan the QR code and scroll to the bottom of the post for links to next steps



1. How will you incorporate one more question in your next math lesson?
2. What strategies will you incorporate as you strive to have an inquiry-based math class?
3. Who will you call upon for help in implementing math professional development in your school or district? All Learners Network (ALN) can come to your school or district for embedded professional development.

