



THREE TIPS FOR ADDRESSING ASSUMPTIONS IN MATH INSTRUCTION



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It is no secret that assumptions about our students' mathematical capabilities can significantly impact a student's experience in their classroom. Utilizing stereotypes and generalized information can lead to instructional implications resulting in students losing access to the support and tools they need. It can also have a significant negative impact on a student's math identity and their self-perception of their mathematical abilities. We also know that these assumptions do not just impact students. These stereotypes and biases impact teachers' perceptions of their own capabilities in math, their students' capabilities, and the capabilities of families and caregivers in our communities.

And - assumptions are a centuries-old tool that serves a need. Our brains are constantly working to make connections. Our brains actively seek ways to do things faster and with less effort. It is constant work to disrupt our assumptions and biases and teach our brains to consider context when interpreting information. This is where acting on assumptions becomes incredibly tricky. If we let assumptions rule us - then we are welcoming a whole host of problems and even - misinformation.

Consider what we know about mathematical assumptions. An axiom or a mathematical assumption is a statement that is either established or self-evidently assumed to be true. Think about the journey of a student learning about numbers and how the mathematical assumptions that work for them in some scenarios, do not work in others. First, they might learn that 0-10 have a specific consecutive sequence and each number increases in value as you count forward. Then, they might experience that when numbers are multiplied they get bigger and when they are divided, they get smaller. At each step - they are creating, memorizing, and even proving these assumptions. And



then - students investigate multiplying by fractions and dividing by decimals and they need to check and shift their mathematical assumptions. The context changed and relying on their previous assumptions is not going to serve them.

As we get new information, we have to do the work to reprogram our assumptions. We have to do the work to know when to push back against the assumption. To do that, we need to know when an assumption creeps up. Remember assumptions are what they are because they are broad statements that are thought to be true. How do we distinguish what is an assumption and what is fact? How do we know when an assumption is causing us to unintentionally harm our students?

One assumption that might be carried by educators and administrators is that students need to be ready for school. On the surface, that might seem innocuous and even helpful. But when we expand the context and see that students all come with varying experiences, identities, and circumstances but that school is the common denominator - all of a sudden there is a need to shift that assumption. When we check that assumption about students being ready for school, we can shift it to getting the school ready for students.

PBS has a series of videos all about bias. In Check Our Bias to Wreck Our Bias, they introduce the idea that implicit bias often comes up when we are deciding who we want to help. And often - we are most likely to help those who share similar identities and experiences to ourselves. What does this mean for those of us who are working with students? This means that we need to allow ourselves the time to closely examine our assumptions. And as PBS suggests in their video - we need to consider how we can audit our own assumptions.

What can you do to challenge your assumptions that show up in how you teach math?

1. Examine your beliefs about the students you work with.

What beliefs do you hold about your student's abilities? Take a moment to really think about this. Do you have any preconceived notions about who can do what? How might those assumptions have crept up in how you introduced the materials? Consider auditing yourself and taking note of who you call on or look to for certain questions. Then, spend time thinking about why this might be. Periodically tracking this information can allow you to try and keep tabs on your behavior and assumptions.

2. Utilize formative assessments to gather information on your students' mathematical thinking

Sometimes assumptions need new data to shift. Formative assessments allow us to push back against implicit or explicit student labeling and provide us with actual information we can use to guide our instruction. At All Learners Network (ALN) we use



our High Leverage Concepts (HLCs) Assessments to assess a student's current understanding of a particular grade level High Leverage Concept.

Examining student work is an incredible way to learn more about student thinking and strategies. We recommend removing student names when reviewing the work, to eliminate unhelpful bias like "this was a tough day for them" or "they made a silly mistake- they must have been rushing again." The ALN Work Sort Protocol is a framework that groups of educators can use to collectively assess student work to inform the next instructional steps.

3. Frequently leverage your community to increase accountability.

When it comes to changing our thinking three guiding words come up: frequency, community, and accountability. We need to frequently practice pushing back against our assumptions so that it becomes part of our standard norm. The more we push against our assumptions, the more automatic it becomes to not rely on them. Growth happens when challenge and support intersect. We need a community of folks to help us in this work. The more we can do it in community, the more successful we will be. One way some educators seek community is through an All Learners Online Unlimited membership. And - we need to hold ourselves accountable for the changes that we need to make. When it comes to checking our assumptions so that we can better teach the humans in front of us, the stakes are high and the payout when we have students who see themselves as capable mathematicians, well, that is pretty incredible.

The thing is that our assumptions did not form overnight. They have had years and years of practice and validation. To shift them, we need to allow ourselves substantial time to readdress and reprogram. So, review the above ideas and know that you are an incredible educator who is capable of shifting your own assumptions.

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



1. Explore blogs like "Disrupt Tracking in Math Classrooms" and "Countering Teaching Through Telling with 4 Inclusive Math Instruction Strategies" to learn more about how bias and assumptions show up in math instruction and educational systems.
2. Utilize free resources like the High Leverage Concepts Resources to help take assumptions and guessing out of your math instruction.
3. Bring All Learners Network (ALN) into your school or district for embedded professional development.

